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Undergraduate Catalog
1984-85

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University Calendar
1984-1985
Fall 1984

August 29, Wednesday
Fall semester begins.
10 a.m., residence halls open for occupancy.

August 30, Thursday
First meal, breakfast, served in residence halls.

August 31, Friday
Last day to register.

September 3, Monday
Labor Day. University holiday.

September 4, Tuesday
7:30 a.m., classes begin.

September 6-10, Thursday-Monday
Student-initiated drop/add.

October 1, Monday
Last day for December degree candidates to file statement of intention to graduate in the academic dean's office.

October 15, Monday
Last day to declare pass/fail intentions.
Last day to drop a course.
Last day to receive grade of W for courses dropped.

October 23, Tuesday
5 p.m., midsemester grade rolls due in the Registrar's office.
Last day for December degree candidates and faculty to order invitations and academic regalia at the Bookstore.

October 29, Monday
Advance registration (currently enrolled students) for spring semester begins.

November 21, Wednesday
12:30 p.m., classes dismissed for Thanksgiving holidays.

November 26, Monday
7:30 a.m., classes resume.

November 30, Friday
Advance registration (currently enrolled students) for spring semester ends.

December 3, Monday
Open registration for spring semester begins.
Last day for December degree candidates to remove grades of I and PR and to complete final examinations in correspondence courses.
Last day to withdraw from the University.

December 10, Monday
Last day for December graduate degree candidates to submit to the Graduate Dean the final copy of theses and dissertations and to pay binding fee.
Last day for December degree candidates to pay diploma fee in the Bursar's office.

December 10-14, Monday-Friday
Period of no examinations except for make-up exams or scheduled lab exams.

December 14, Friday
Last day of classes.

December 15-20, Saturday-Thursday
Final examinations for the fall semester.

December 21, Friday
General commencement ceremony.

December 22, Saturday
10 a.m., residence halls close.
Fall semester ends.

December 24, Monday
9 a.m., final grade rolls due in the Registrar's office.

Spring 1985

January 9, Wednesday
Spring semester begins.
10 a.m., residence halls open for occupancy.

January 10, Thursday
First meal, breakfast, served in residence halls.

January 11, Friday
Last day to register.

January 14, Monday
7:30 a.m., classes begin.

January 16-18, Wednesday-Friday
Student-initiated drop/add.

February 8, Friday
Last day for May degree candidates to file statement of intention to graduate in the academic dean's office.

February 22, Friday
Last day to declare pass/fail intentions.
Last day to drop a course.
Last day to receive grade of W for courses dropped.

March 4, Monday
5 p.m., midsemester grade rolls due in the Registrar's office.
Last day for May degree candidates and faculty to order invitations and academic regalia at the Bookstore.

March 9, Saturday
Noon, classes dismissed for spring vacation.

March 18, Monday
7:30 a.m., classes resume.

April 8, Monday
Day of no classes.

April 18, Thursday
Last day for May degree candidates to remove grades of I and PR and to complete final examinations in correspondence courses.
Last day to withdraw from the University.

April 25, Thursday
Last day for May graduate degree candidates to submit to the Graduate Dean the final copy of theses and dissertations and to pay binding fee.
Last day for May degree candidates to pay diploma fee in the Bursar's office.

April 25-May 1, Thursday-Wednesday
Period of no examinations except for make-up exams or scheduled lab exams.

May 1, Wednesday
Last day of classes.

May 2-7, Thursday-Tuesday
Final examinations for the spring semester.

May 8, Wednesday
10 a.m., residence halls close. Degree candidates may occupy rooms until 10 a.m., Sunday, May 12.

May 9, Thursday
9 a.m., grade rolls for graduating students due in the Registrar's office.

May 10, Friday
General commencement ceremony.

May 11, Saturday
Commencement ceremonies for colleges.
Spring semester ends.

May 13, Monday
9 a.m., final grade rolls due in the Registrar's office.

Summer 1985

First Term

June 3, Monday
2 p.m., residence halls open for occupancy.

June 4, Tuesday
First term begins.
7:30 a.m. to 6 p.m., registration for the first term.
First meal, breakfast, served in residence halls.

June 5, Wednesday
7:20 a.m., classes begin.

June 6-7, Thursday-Friday
Student-initiated drop/add.

June 20, Thursday
Last day to declare pass/fail intentions, to drop a course, or to receive grade of W for courses dropped.

July 3, Wednesday
Last day to withdraw from the University.

July 4, Thursday
Independence Day. University holiday.

July 10, Wednesday
Last day of classes.

July 11-12, Thursday-Friday
Final examinations for the first term.

July 13, Saturday
Students without room reservations for the second term must vacate residence hall rooms by 10 a.m.
First term ends.

July 15, Monday
Final grade rolls due in the Registrar's office.

Second Term

July 14, Sunday
10 a.m., residence halls open to new occupants.

July 15, Monday
Second term begins.
7:30 a.m. to 6 p.m., registration for the second term.

July 16, Tuesday
7:20 a.m., classes begin.

July 17-18, Wednesday-Thursday
Student-initiated drop/add.

July 31, Wednesday
Last day to declare pass/fail intentions, to drop a course, or to receive grade of W for courses dropped..

August 14, Wednesday
Last day to withdraw from the University.
Last day for August degree candidates to file statement of intention to graduate in the academic dean's office and to pay diploma fee in the Bursar's office.
Last day for graduate degree candidates to submit to the Graduate Dean the final copy of theses and dissertations and to pay binding fee.

August 20, Tuesday
Last day of classes.

August 21-22, Wednesday-Thursday
Final examinations for the second term.
Residence hall dining halls close with serving of the evening meal on Thursday.

August 23, Friday
10 a.m., residence halls close.
Final grade rolls due in the Registrar's office.

August 24, Saturday
Summer session ends.

General Information

The Undergraduate Catalog

This catalog is an official publication of Texas Tech University containing policies, regulations, procedures, and fees in effect as the publication went to press. The University reserves the right to make changes at any time to reflect current board policies, administrative regulations and procedures, amendments by state law, and fee changes.

Students are urged to study the contents of this catalog carefully, for they are responsible for observing the regulations contained herein.

Other official publications issued by the University include *Texas Tech University Handbook, Scholarships and Financial Aid, Graduate Catalog, Law School Catalog, Summer School Catalog,* and *Faculty Handbook*. The *Code of Student Affairs* includes the institution's policies and regulations relating to student conduct.

Courses to be offered during any semester or summer term are announced prior to the registration period for that semester or term in the form of class schedules.

Equal Opportunity Policy

Texas Tech University is open to all persons regardless of race, color, religion, sex, age, national origin, or handicapped condition who are otherwise eligible for admission as students. All students admitted to the University are treated without discrimination with regard to their participation in educational programs or activities which the University offers.

The University is an equal opportunity employer and no applicant or employee will be discriminated against because of race, color, religion, sex, age, national origin, or handicapped condition concerning employment or during the course of employment in the institution.

The University does not discriminate on the basis of sex in its educational programs. Any inquiries concerning Title IX, or any complaints pursuant to Title IX, should be referred to Dr. Robert H. Ewalt at the Office of Student Affairs, 213 Administration Building, telephone (806) 742-2131.

Students with Disabilities

Students with disabilities attending Texas Tech will find numerous programs designed to provide services and to promote access to all phases of University activity. Such programming is coordinated through the Dean of Students' Office with the assistance of an advisory committee of both disabled and nondisabled students, faculty, and staff.

Support services available through the Dean of Students' Office include student orientation and advisement, registration assistance, publication of campus accessibility and information guides, coordination of auxiliary aide and support services, student development training programming, technical assistance in modifying course requirements, testing procedures and campus facilities, and referral to a variety of campus resources.

Prospective and current students, parents, and others interested in such services or more information should contact the Coordinator of Disabled Student Services, Dean of Students' Office, 250 West Hall, (806) 742-2192.

State offices of the Texas Commission for the Blind and the Texas Rehabilitation Commission are also located on the Texas Tech campus.

Texas Tech University

Purpose

The role of Texas Tech University is that of a multipurpose state university with a range of program offerings which provide the opportunity for a liberal education for all students and for professional training at the undergraduate and graduate levels. In addition, the University recognizes the value of the University's participation in community service and the significance of scholarly research leading to effective dissemination of knowledge.

The Campuses

More than 23,000 students attend classes in Lubbock on the University campus, which, with 1,839 acres in one contiguous tract, is one of the largest in the U.S. The University also operates the Texas Tech University Center at Amarillo, an educational facility and agricultural research farm of nearly 14,000 acres in the Texas Panhandle, and the Texas Tech University Center at Junction, an educational facility consisting of 411 acres in the Texas Hill Country.

Location

Lubbock, with a population of nearly 180,000, is located atop the caprock on the South Plains of Texas. Its climate is excellent, with over 3,550 hours of sunshine every year. Summers are dry and not extremely hot, while winters are dry and moderate (average annual rainfall is only 18 inches). An average annual temperature of 60° coupled with the average noon humidity of 46% combine to make Lubbock comfortable year round. The city lies 320 miles west of Dallas and 320 miles southeast of Albuquerque, New Mexico. Several major airlines and an interstate bus line serve the city, as well as four U.S. highways, including an interstate highway.

History

Created by legislative action on February 10, 1923, Texas Technological College was located in Lubbock. Texas Tech opened in the fall of 1925 with six buildings and an enrollment of 910. The subdivisions for instruction, called "colleges" of Liberal Arts, Household Economics, Agriculture, and Engineering in the *Preliminary Announcement of First Annual Catalogue 1925-1926,* became "schools" before the opening date for instruction in 1925, and "Household" had become "Home Economics." In 1933 these units became, in this order, the "divisions" of Agriculture, Engineering, Home Economics, and Arts and Sciences. In 1944 the designation reverted to "schools" listed alphabetically.

Graduate instruction was begun in the fall of 1927 within the School of Liberal Arts. In 1935 a "Division of Graduate Studies" was established; in 1954 it became the Graduate School.

The Division of Commerce, created in 1942, became the Division of Business Administration in 1947, and the School of Business Administration in 1956. Both the School of Law, provided for in 1965, and the School of Education, organized in 1966, began instruction in 1967. The School of Agriculture became the School of Agricultural Sciences in 1968.

By action of the Texas State Legislature, Texas Technological College formally became Texas Tech University on September 1, 1969. At that same time the schools of Agricultural Sciences, Arts and Sciences, Business Administration, Education, Engineering, and Home Economics became known as "colleges."

Texas Tech's greatest growth came after World War II. Graduate programs in most of the academic areas were instituted, the library was expanded, and the athletic program was incorporated into the Southwest Athletic Conference. In the fall of 1982 the enrollment was 22,849.

Texas Tech University is one of the youngest major universities in the nation, and a spirit of intellectual growth pervades the campus. Many of the special facilities for research, such as the Computer Center, the Seismological Observatory, and the Southwest Collection, are described on subsequent pages of this catalog. The library, heart of the academic world, is one of the finest in the Southwest, with strong collections in the humanities and in the biological and physical sciences.

Presidents of Texas Tech have been Paul Whitfield Horn (1925-1932), Bradford Knapp (1932-1938), Clifford Bartlett Jones (1938-1944), William Marvin Whyburn (1944-1948), Dossie Marion Wiggins (1948-1952), Edward Newlon Jones (1952-1959), Robert Cabaniss Goodwin (1960-1966), Grover Elmer Murray (1966-1976), Maurice Cecil Mackey, Jr., (1976-1979). Lauro Fred Cavazos became President on April 1, 1980.

Financial Support

The University receives the major share of its educational and general operating funds from appropriations by the legislature. For the construction of academic and general buildings, funds are made available from ad valorem taxes, building use fees, Skiles Act, and federal matching funds. State appropriated funds are not used to support the residence halls, intercollegiate athletics, bookstore, student publications, health service, press, or University Center.

The Texas Tech University Foundation is a nonprofit corporation which serves as the gift-receiving agency of the University. Gifts and grants received through the foundation supplement state funds in supporting research, maintaining scholarships and fellowships, and helping to provide physical facilities and educational materials.

Organization

Texas Tech University is governed by a Board of Regents whose nine members are appointed to six-year terms by the Governor of the State of Texas; the terms of office of three Regents expire every two years. The Board is legally responsible for the establishment and control of the University's policies; it appoints the President who directs the operations of the institution and is responsible for carrying out policies determined by the Regents. The President also confers all degrees upon recommendation of the faculty and under authority vested by the Regents.

The President is assisted by a Vice President for Academic Affairs who oversees the educational programs of the University, a Vice President for Finance and Administration who is responsible for all the fiscal operations and administrative support functions of the University, a Vice President for Development who coordinates the fund-raising activities of the University, a Vice President for Research and Graduate Studies who oversees the research efforts of the University and serves as Dean of the Graduate School, and a Vice President for Student Affairs who is concerned with the general welfare of the students of Texas Tech University.

Texas Tech consists of six colleges and two schools: the College of Agricultural Sciences, the College of Arts and Sciences, the College of Business Administration, the College of Education, the College of Engineering, the College of Home Economics, the School of Law, and the Graduate School. Each college is administered by a dean and his or her staff, and each consists of a number of instructional departments or areas.

Facilities and Services

Texas Tech University Center at Amarillo. The University operates the Texas Tech University Center at Amarillo. This farm consists of approximately 5,822 acres of deeded land and an agricultural use permit on an additional 10,000 acres controlled by the Department of Energy.

The University Center at Amarillo serves as a valuable facility for agricultural research and education, adding strength, flexibility, and prestige to the academic programs at Texas Tech. Opportunities are provided for studies in livestock, crops, soils, range management, entomology, agricultural economics, and water use.

Special tours of the center are arranged at the request of interested individuals and groups by contacting the Office of the Dean, College of Agricultural Sciences.

Texas Tech University Center at Junction. The Texas Tech University Center at Junction encompasses 411 acres, including large stands of river-bottom pecan woodland, on the South Fork of the Llano River in the beautiful Texas Hill Country. The center consists of two academic buildings, a large lecture hall and dining area, four classroom/living quarter study areas, a large two-story laboratory and faculty housing unit, and two combination seminar/housing units. Within these air-conditioned and heated structures are twelve classrooms, four wetlabs, a large darkroom, a library, a soundproof room, an audiovisual room, and six small office/meeting rooms. The campus also contains a seismograph station and a large art complex comprised of three cabins and a covered kiln area. Air-conditioned accommodations can provide for up to 130 people while an additional 120 can be housed in 10 rustic screened cabins that share a large central bathhouse. Full meal service is available year round.

The center offers regular, full-credit undergraduate and graduate courses over three-week periods during May through July. These courses include art, biology, botany, zoology, entomology, range and wildlife management, geology, geography, photography, education, physical education, museum science, and anthropology. In addition to regular credit courses, the center is used for workshops, retreats, continuing education short courses, and other special activities. The center is available to Texas Tech student organizations, faculty groups and

courses. The richness of the flora and fauna and the beauty of the physical setting create an unusually relaxing atmosphere for these programs while also providing the opportunity for intensive academic study.

ICASALS. The International Center for Arid and Semi-Arid Land Studies (ICASALS) was created in 1966 to promote the University's special mission—the interdisciplinary study of arid and semi-arid environments and the human relationships and problems of those areas, which encompass about one-third of the earth's land surface.

ICASALS' purpose is to stimulate, coordinate, and implement teaching, research, and public service activities related to all aspects of the world's arid and semi-arid areas. ICASALS brings together the sciences, technologies, humanities, and arts, with a particular emphasis on applied research and education concerning those regions where low productivity and low rainfall significantly affect the inhabitants and economies involved.

ICASALS administers a successful interdisciplinary master's degree option in arid land studies—the only degree of its kind in the world. Drawing from all departments in all colleges at Texas Tech, the degree can be earned as either a Master of Science or a Master of Arts. Scholarship funds are available in support of the program, and graduate placement into related jobs has been 100 percent.

An interdisciplinary doctoral program in Land-Use Planning, Management, and Design provides training in several facets of land use, with special emphasis on arid and semi-arid environments.

Approximately 150 Texas Tech faculty have been designated "ICASALS Associates" and provide a broad base of expertise for the numerous and varied functions of the center.

Disseminating information about arid lands research and development, ICASALS publishes several newsletters with international readerships. It supports and facilitates publications resulting from symposia, research, and professional meetings. ICASALS operates an international data exchange and coordinates research and consultations for international scholars, government officials, and students coming to Texas Tech for scholarly purposes. ICASALS also serves as a contracting unit of the University for international programs.

Museum. The Museum of Texas Tech University is located on the campus at 4th Street and Indiana. Its purpose is to interpret the physical, biological, and social heritages unique to the semi-arid and arid lands of West Texas, North America, and the world.

The building, completed in 1970, contains over 160,000 square feet of galleries, research facilities, classrooms, work areas, and storage space. A 40-foot mural, created in India ink by Peter Rogers, dominates the lobby. The Ranching Heritage Center, an outdoor exhibit containing 33 restored historic structures related to the ranching and livestock industries of West Texas, was dedicated on July 4, 1976. Museum exhibits include permanent and temporary displays drawn from its own collections as well as traveling exhibits.

The Moody Planetarium, a 90-seat auditorium with a Spitz A4 projector, has daily programs for the public. These programs begin at 2:30 p.m. on weekdays, 7:30 p.m. on Thursday evenings, and 2 p.m. and 3:30 p.m. on Saturday and Sunday.

A Master of Arts degree in Museum Science is offered using the entire museum as the teaching laboratory.

Although the chief source of funding for the museum and its programs is the legislative appropriation, additional support comes from the West Texas Museum Association and the Ranching Heritage Association. Additionally, the West Texas Museum Association publishes the *Museum Digest* and the *Museum Journal* for distribution to all members. The Ranching Heritage Association issues the *Ranch Record*. Membership in these associations is open to all persons interested in the museum.

The museum is open from 9 a.m. to 4:30 p.m., Monday through Saturday (Thursday evening until 8:30 p.m.), and from 1 to 4:30 p.m., Sunday.

Ranching Heritage Center. An integral element of the museum is the 14-acre outdoor exhibit of 33 historic structures, dating from the 1830s to about 1917, which have been moved to the site from locations throughout the state and authentically restored to illustrate the development of the ranching industry in Texas.

The Ranching Heritage Center is open to the public Monday through Saturday from 9 a.m. to 4:30 p.m. and Sunday from 1 to 4:30 p.m..

Library. The Library is an integral part of Texas Tech University and supports the University's teaching, research, and service mission, and its quest for excellence. As the primary repository of information on campus, the Library—in all its constituent parts—identifies, acquires, describes, organizes, preserves, interprets, and disseminates information in many different formats and by various available means. It is the basis for classroom instruction, scholarly and scientific research, and individual development. The Library serves the University community of students, faculty, and staff. Cognizant of its role as a major research library, it also provides materials, whenever possible, to other libraries and scholars on local, regional, national, and international levels.

The Library contains over two million bibliographic items, which include more than 7,000 periodical subscriptions and approximately 400,000 units of microforms. The University Library building was constructed in two phases. The first was completed in 1962. The entrance to this part of the Library is through the lovely William Lloyd Croslin Room, with its tropical plants, terrazzo floor, and sunken pool and fountain. Tiled screens on each end of the room separate an ensemble of two huge oval tables, and the entire room is furnished with colorful contemporary lounge furniture. The second phase was occupied in September 1975 and consists of the stacks and expanded Reference and Circulation facilities.

Forty-one professional librarians, assisted by forty-four subprofessionals and over one hundred students, are on duty to serve the Library user. Holiday schedules vary and are posted well in advance. The summer schedule is subject to some variation with hours posted. Service is augmented by a number of rapid-copy machines. The Library basement houses a microcomputer laboratory that is available for both scheduled classroom and individual student/faculty use. The Library is a member of the OCLC, which instantly links the Library with many other libraries.

Noteworthy is the fact that the University Library is one of two Regional Depositories for U.S. Government Documents in Texas. The *Checklist of United States Public Documents, 1789-1970,* contains bibliographic data on more than

two million U.S. Government Publications. The *Library of Congress Presidential Papers Program* is complete and available on microfilm.

The Library holds several special collections, including the *Microbook Library of American Civilization* (microfiche), the private library of the 20th century Yiddish poet Selig Heller, Lawrence Thompson's *Bibliography of Spanish Plays* (microcard), extensive holdings related to novelist Joseph Conrad, recently acquired, the Second Dalhousie Manuscript, containing writings of the English poet John Donne, Archive of Turkish Oral Narrative, the Center for the Visually Impaired, and the Institute for Studies in Pragmaticism.

Southwest Collection. The Southwest Collection is both the University archives and a regional repository for historical information pertaining to West Texas and the near Southwest. Nationally recognized for its ranch-related records, the Southwest Collection also collects materials on such topics as agriculture, land colonization, petroleum, mining, water, urban development, politics, pioneering, and life of the times. In addition to personal papers and noncurrent business and institutional records, it collects, preserves, and makes available for research books, maps, periodicals, photographs, newspapers, taped interviews, movie films, video tapes, and microfilm.

Descriptions of specific collections are published by the Library of Congress in the *National Union Catalog of Manuscript Collections.*

All materials may be used by both the University community and the general public for research or reference. The Southwest Collection is located in 106 Mathematics Building. Service is provided 8 a.m. to 5 p.m., Monday through Friday (until 7 p.m., Tuesday) and 9 a.m. to 3 p.m., Saturday (closed on Saturday during the summer, except by arrangement). Inquiries and donations are welcomed. Tours are available.

Municipal Auditorium-Coliseum. The Municipal Auditorium-Coliseum, located on the north edge of the campus near Jones Stadium, is operated by the City of Lubbock. Its facilities are frequently rented by the University for such occasions as convocations, registration, graduation exercises, cultural events, basketball games, rodeos, and other special events. The auditorium will seat approximately 3,200 persons and the coliseum, approximately 10,000 persons. Rental arrangements are made through the Contracting Office.

Lubbock Memorial Civic Center. These facilities are also operated by the City of Lubbock and are available for rental for special events. All applications for rental by Texas Tech and the Texas Tech University Health Sciences Center should be made through the Contracting Office.

Jones Stadium. Clifford B. and Audrey Jones Stadium, named for Texas Tech's late President Emeritus and his wife who provided the initial funds to make possible its construction, was built in 1947 on the north side of the campus. In 1960 it was enlarged to a capacity of 41,500 permanent seats. About 5,000 more seats can be placed on the north slope, which is usually used for overflow crowds. Since state tax money is not used for intercollegiate athletics at Texas Tech, bonds were issued to help finance the stadium expansion.

Precedent-setting methods were used in this expansion. First, the entire east stands — more than 10 million pounds of concrete and steel — were moved 226 feet eastward. Then the area between the east and west stands was excavated

to a depth of 30 feet — 259,000 cubic yards of earth being removed. At the bottom of the man-made bowl, a new gridiron was laid out and new turf planted. Along the slopes created by the excavation new seats were constructed, bringing the stadium to a capacity of 41,500 seats.

Although other stadiums are larger, few have more seating between the goal lines, since only 4,500 permanent seats are in the south end zone. A donation by Dr. Jones in 1972 provided funds for an additional 4,500-seat enlargement to the east and west stands. Total seating capacity is now 47,000 permanent seats.

The stadium was further renovated prior to the 1978 season with the installation of new synthetic turf and new seats throughout the entire stadium. In addition, a new ticket office-lounge complex on the north end of the stadium was opened in the fall of 1979 and the Athletic Department offices were renovated in 1980. In 1983, the home dressing room was enlarged and remodeled.

Textile Research Center. The Textile Research Center has a continuing history of service in aiding the fiber and textile interests of Texas. The scope of the center includes fiber evaluation involving cotton, animal fiber, and man-made fibers; the production and evaluation of yarns and fabrics made from these fibers; research and evaluation of new textile processing systems; explorations into the chemistry of dyeing and finishing yarns and fabrics; research on fabric finishes for specific purposes, such as flame resistance; and research in fabrics and garments best suited for physically and mentally handicapped persons.

The objectives of the Textile Research Center are to conduct research that will lead to greater utilization of the natural fibers produced in Texas, to assist textile manufacturers in solving problems related to the use of all types of textile fibers, to develop new products from the fibers produced in Texas, and to assist with the improvement of textile processing techniques.

The facilities at the center include a Materials Evaluation Laboratory for determining the properties of fibers, yarns, and fabrics; a complete Spinning Laboratory with 1,200 ring spindles and over 200 open-end spinning units; a Worsted Laboratory for processing animal fibers and long-staple synthetics; a Weaving Laboratory for the production of both plain and fancy woven fabrics; a Knitting Laboratory for conducting research on knitted fabrics and garments; and a Chemical Processes Laboratory for researching textile dyes, finishes, and chemicals that lead to better processing and new end-products.

Computing Services. The University provides extensive computing resources for students, faculty, and staff for use on approved projects in the areas of instruction, research, and administration. Computing Services currently maintains and operates three computing systems: an IBM 3033 U12 running MVS/SP for batch and teleprocessing (on-line terminal and RJE) processing; a DEC VAX 11/780 running VMS for interactive instructional/research use; and a National Advanced System AS/6 running VM/CMS (also fully interactive) for instructional/research use. Computing Services operates terminal rooms and consulting services at both the Computer Center and the College of Business Administration and its supports other departmentally operated terminal facilities throughout the campus. Computing short courses are provided to assist users in learning to use available computing services. General use microcomputer labs are available in the Computer Center and in the University Library. Note that some academic departments may require students to acquire or to have access to a

micro/personal computer. Students should check with their major department regarding possible requirements in this area.

Plotting and optical scanning services as well as limited amounts of statistical consultation and programming assistance are offered as a service to users. A complete listing of services, user guides, and special displays of job control formats for various programming languages are available at the Computer Center to assist programmers. In addition, a library of statistical packages and special programs is maintained. Computing Services also runs a courier service to designated areas on campus. Application forms for computing account numbers may be obtained from the Data Librarian in the Computer Center.

Vending Machines. There are snack and soft drink concession machines in most buildings on the campus which are owned and serviced by contract vendors under the direction of the Director of Contracting and Purchasing.

Seismological Observatory. The Seismological Observatory is located adjacent to the Science and Chemistry buildings. The observatory has been in continuous operation since 1956 and since 1961 has been one of the stations of the World-Wide Standard Seismograph Network. It serves as the center of research in seismology and as a laboratory for graduate students in geophysics. An additional World-Wide Standard Seismograph station, located at Junction, Texas, is operated as a part of the Texas Tech research effort in geophysics.

KTXT-FM. KTXT-FM is the University-owned radio station. Operating on a frequency of 88.1 mhz with a power of 18,500 watts (ERP), the station provides a service of music, news, and special programs of interest to the campus community. It provides a channel of communication within the Texas Tech community and from the University to the Lubbock community. KTXT-FM is operated by the Department of Mass Communications and is managed by a faculty director and staffed by Texas Tech students. Station facilities are also used by students enrolled in telecommunications courses.

KTXT-TV. Station KTXT-TV (Channel 5) is an open-channel, noncommercial educational television station owned and operated by Texas Tech through the Division of Continuing Education. The offices, studio, transmitter, and 817-foot tower of KTXT-TV are located on the southwestern part of the campus. The station broadcasts approximately 90 hours of programming per week throughout the year. The signal coverage area (within a 60-mile radius of Lubbock) contains a population of approximately 343,000.

Channel 5 is staffed and managed by professional personnel who produce many of the stations's programs. It is a member of the PBS (Public Broadcasting Service) noncommercial network, which is comprised of over 267 television stations interconnected by satellite. The station has complete color production, remote, and network facilities and provides a wide range of programming for South Plains residents.

Much of the regular programming on Channel 5 is used in the curricula of the University's academic departments. In addition, the station acquires/produces programming that is specially designed for televised college credit courses (for resident and nonresident students) and other noncredit educational efforts serving all age groups in its viewing area. KTXT-TV also operates a 5-channel closed-circuit television cable system that feeds instructional television programming to classrooms throughout the Texas Tech campus.

University Theatre. A regular schedule of major dramatic productions is presented each school year under the direction of professionally qualified members of the theatre arts faculty. Plays are chosen so that each student generation has an opportunity to see a representative selection of the great plays of the past as well as works by modern playwrights. Every four-year cycle includes a Greek tragedy, a Greek or Roman comedy, a Shakespearean tragedy, a Shakespearean comedy, another Renaissance play, a major realistic play, and a Moliere, Restoration, or Eighteenth-Century comedy. These plays are presented in the University Theatre, a modern, air-conditioned building designed for flexibility in production as well as enjoyment of performance. The theatre seats 395 patrons in a comfortable, continental arrangement.

A program of student-directed productions is presented in the Laboratory Theatre temporarily located in the Agricultural Engineering Auditorium. In addition, a repertory season of musical plays is presented each summer in collaboration with the Music Department. Participation in this production program affords laboratory experience for students in theatre arts, but all students of the University are eligible to take part.

Child Development Center. The Department of Home and Family Life in the College of Home Economics operates a Child Development Research Center which offers morning, afternoon, and full-day programs for children from birth to six years old. These laboratories provide varied opportunities for University students to acquire information and skills regarding the development and guidance of young children. The CDC research components include investigations of child behavior and the generation of innovative strategies for promoting human development and family studies across the life span. Enrollment is open to children of any race, creed, or nationality. Applications should be made through the Child Development Center Office, Department of Home and Family Life.

Check Cashing Services. For convenience of the student, personal checks printed with magnetic ink characters may be cashed for limited amounts at the University Bookstore and the University Center upon presentation of current student identification card, certification of enrollment, and valid driver's license. Checks returned by the bank may subject the student to suspension of check cashing privileges and/or disciplinary action.

The University Center also has several automatic teller machines available for students' use. Anyone having the ATM access cards honored by financial institutions may use these machines for a variety of transactions. The ATMs are located in the northwest lobby of the center and are normally accessible 24 hours a day.

Campus Bus System. The campus bus system, funded in part by the Student Services Fee, provides transportation throughout the campus and to nearby off-campus residential areas. On-campus routes provide service from the residence halls and commuter parking lots to the interior part of the campus. In addition, some routes extend as far away as three quarters of a mile from campus to provide service to students living in nearby off-campus housing.

The University Police also provide a shuttle bus service from dark until 3 a.m.

Psychology Clinic. The Psychology Clinic, located on the ground floor at the east end of the Psychology Building, was established primarily to provide practicum experience for advanced graduate students in clinical and counseling

psychology. Psychological testing and long- and short-term counseling and psychotherapy are available to Texas Tech students and staff and to children and adults in the community. Clients are often referred to the clinic by other agencies or individuals, but no referral is necessary.

Research and Training Center in Mental Retardation. The objective of this facility is to assist in the rehabilitation of mentally retarded persons by conducting applied research projects and training programs for rehabilitation personnel. The research, to define new and better techniques of rehabilitation, focuses on four main areas: the work potential of mentally retarded persons, rehabilitation counseling and the service delivery system, community adjustment and training, and the multiply handicapped. Training activities include inservice short-term training programs of a local, regional, and national scope as well as consultation services, materials development and information dissemination. The R&T Center reaches more than 6,000 with its materials, including training packages, monographs, and research papers. A vocational evaluation center for handicapped persons began operation in 1981.

Included on the Research and Training Center's staff are those with academic preparation in psychology, special education, and rehabilitation. Staff members teach courses in a variety of areas at the University, including the special education and rehabilitation counseling programs. The R&T Center also helps to train future rehabilitation personnel by employing graduate and undergraduate assistants.

Speech and Hearing Clinic. The Speech and Hearing Clinic, located in the University Theatre Building, with offices in the Foreign Language Building, is designed as a clinical practicum for students and staff in speech pathology, audiology, and deaf education by providing clinical services for the students, faculty, and staff of Texas Tech as well as for residents of Lubbock and the west Texas, eastern New Mexico area. Individuals are accepted by self-referral and upon referral from physicians, social agencies, and public or private schools. Diagnostic services and therapy are provided for children and adults with hearing problems or communication disorders in language, voice, articulation, and stuttering. Anyone wanting to use these services should contact the Speech and Hearing Clinic Office, Room 257 in the Foreign Language Building or call 742-3908.

Transcript Service. Copies of a student's transcript are available upon written request to the Registrar's Office. A copy of the transcript includes only the academic record accumulated at Texas Tech. The cost is $2 per copy, payable in advance. Copies of transcripts furnished from other institutions become the property of Texas Tech and will not be furnished by the University. All transcript requests must be made by the student and must be in writing. Adequate advance notice, normally one week, is required for transcript processing. Contact the Registrar's Office, Box 4570, Texas Tech University, Lubbock, Texas 79409.

Recreational Sports. The Department of Recreational Sports serves the leisure needs of Texas Tech students through its six main divisions: intramurals, open recreation, sport clubs, aquatics, clinics and classes, and the outdoor program.

Through the intramural program, competition is offered in many coed, men's, and women's sports activities. These competitive activities include individual, dual, and team competition organized for residence halls, clubs, fraternities,

sororities, and for unaffiliated students in an "open" division. A campus community (CC) program has also been developed to provide competition for graduate students, faculty, and staff.

Open recreation provides an opportunity for informal, nonscheduled activities at the various recreational facilities on campus for students, faculty, and staff. The Student Recreation Center, comprising 126,000 square feet, provides for most indoor recreational needs. The program also provides court reservation opportunities for tennis courts and racquetball courts and for checkout of a variety of sports equipment.

Sport clubs offer a unique diversion from academic life through instruction and extramural or intercollegiate athletic competition on a club basis. Organized clubs include archery, soccer, bowling, wrestling, lacrosse, handball, racquetball, polo, judo, volleyball, cycling, rifle, pistol, sailing, and gymnastics — all of which receive some funding from the Department of Recreational Sports.

Texas Tech's indoor-outdoor aquatic facility, which adjoins the Student Recreation Center, offers a wide range of water sports and activities to students. This facility is one of the most unusual in the nation, with a removable bubble top which allows participants to enjoy an outdoor facility during warm-weather months. The aquatic facilities and programs are available to students daily throughout the year.

The outdoor program provides a unique service for students, faculty, and staff. It includes an outdoor equipment rental shop, regularly scheduled trip outings, and a resource area with information on outdoor activities. Students may reserve a variety of equipment ranging from canoes to lanterns through the outdoor program. The outdoor programs office is located on the upper level of the Student Recreation Center.

Motor Vehicle Regulations. Students who operate motor vehicles on campus are required to register their vehicles and comply with the currently approved and published *Traffic and Parking Regulations*. This publication and vehicle registration forms are available at the Traffic and Parking Coordinator's Office.

Texas Vocational Rehabilitation. Vocational Rehabilitation has several programs of educational assistance for disabled persons designed to equalize employment opportunities for those persons, who, because of accident, disease, or congenital deformity, have an impairment that constitutes a barrier to normal employment or preparation for it.

For detailed information concerning these programs, write to Vocational Rehabilitation Commission, Austin Central Office, 118 East Riverside Drive, Austin, Texas 78704 or to the Vocational Rehabilitation Counselor, Box 4440, Texas Tech University, Lubbock, Texas 79409.

University Police Department. This branch of physical plant operations is under the supervision of the Associate Vice President for Administrative Services. It provides security for the entire University plant and community (which is much larger than many towns in Texas) in addition to handling campus traffic and parking problems.

Division of Continuing Education. Continuing education and public service, along with teaching and research, are recognized as major functions of the University. The Division of Continuing Education offers programs for professional development and cultural and personal enrichment, as well as opportunities for

degree-seeking students. The division maintains educational and informational services to assist the general public as well as government, business, industry, and other institutions seeking solutions to social, economic, and educational problems.

For those who cannot attend regularly scheduled campus classes, the Division of Continuing Education offers courses by correspondence and selected courses by extension. All credit correspondence and extension courses have been approved by the Southern Association of Colleges and Schools. The Division of Continuing Education is an institutional member of the National University Continuing Education Association and a charter member of the Council on the Continuing Education Unit.

If degree credit is desired, the student's correspondence and extension work is subject to approval by the academic dean. Students in residence at Texas Tech may begin or continue correspondence or extension work *only with approval of their academic deans.*

Off-Campus Classes. At the request of an institution, organization, or a sufficient number of persons, off-campus classes may be organized. To justify organization of such a class, the number of students required increases with the distance from the campus. Both graduate and undergraduate courses may be offered off campus.

Registration fees for off-campus, extension courses vary. All fees must be paid in advance and are not refundable after the first class meeting. Students wishing to drop an off-campus course should contact their academic dean and the Division of Continuing Education to avoid receiving a failing grade for the course. (See "Grading Practices" section of this catalog.)

A limited number of courses providing residence credit are offered off campus by some departments. Normal residence registration fees apply to such courses. Requests to have credit courses offered off campus should be submitted three months before the start of the semester for which the course is requested.

One-fourth of the hours required for a bachelor's degree in residence may be earned through extension classes and correspondence study. Not more than 18 semester hours may be completed through correspondence study for a residence degree. A maximum of 6 hours of off-campus, nonresident class credit will be allowed toward a master's degree (a maximum of 9 hours on a 36-hour program).

Correspondence Courses. Based on enrollment, Texas Tech has one of the largest correspondence divisions in the United States.

Any high school or college correspondence course may be taken for continuing education credit. In such a case, a student will receive Continuing Education Units which are recorded on the student's nonacademic transcript. The fees for continuing education credit are the same as regular enrollment fees.

High School Level Correspondence Courses. Courses offering high school credit are available in the following fields: agriculture, anthropology, business education, economics, English, health education, homemaking education, history, journalism, mathematics, psychology, religion, science, sociology, and social studies. As needs demand, courses may be added or deleted from the correspondence curriculum. Applications for correspondence courses must be approved by the high school superintendent, principal, counselor, or registrar, and course work must be completed at least 30 days before grades are needed. All courses are approved by the Texas Education Agency.

The enrollment fee is $39 for each semester credit (one-half unit).

Inquiries concerning specific courses or general information should be addressed to the Division of Continuing Education, Box 4110, Texas Tech University, Lubbock, Texas 79409.

College Level Correspondence Courses. Academic departments assure that college correspondence courses provide learning equivalent to respective courses taken in residence. Each course for which college credit is received must be concluded by a final examination taken under the supervision of an approved examiner. Correspondence courses have the same course name and number and provide the same semester hours of credit as respective residence courses. College courses offered through correspondence are taught by members of the Texas Tech faculty.

Each college correspondence course is available to students desiring early college entrance credits, needing enrollment in a course to fulfill a degree requirement, or wishing to take a Texas Tech credit course but unable to be on campus.

The enrollment fee for each correspondence course is $23 per semester hour.

A resident student at Texas Tech may apply up to 18 semester hours of correspondence study toward a bachelor's degree. No resident student may register for or complete a correspondence course during the last semester or summer term before graduation, unless registration is approved by the academic dean. In any event, no more than 6 hours of the final 30 hours may be completed by correspondence, and none of the 6 hours may be a part of the major or minor resident degree requirements.

All correspondence course grades are a part of the student's overall grade-point average. A student may enroll in a correspondence course under the pass-fail option. Regulations concerning this option are the same as those for resident courses taken pass-fail. The pass-fail form must be processed before the student submits the first lesson.

If enrolled in both long and summer sessions and carrying a normal course load, a student pursuing a degree program at Texas Tech may not complete more than 6 semester hours by correspondence during that 12-month period. If a student's course load differs from the norm, the number of hours permitted by correspondence may vary and should be verified by the student's academic dean.

A student who fails a course in residence may not take that course (or a degree-plan alternate course) by correspondence.

The following college courses are taught by correspondence:

College of Agricultural Sciences

Agricultural Science (AGSC)
1111. The Agricultural Industry

Agricultural Economics (AECO)
1301. Introduction to Agricultural Economics
2306. Principles of Marketing Agricultural Products
3302. Agricultural Finance

Plant and Soil Science (PSS)
4323. Weed Control

College of Arts and Sciences

Anthropology (ANTH)
2302. Cultural Anthropology

Biblical Literature
Religion (RELG)
1301. Introduction to the Old Testament
1302. Introduction to the New Testament

Economics (ECO)
2311. Principles of Economics I
2312. Principles of Economics II

English (ENGL)
1301. Essentials of College Rhetoric
1302. Advanced College Rhetoric
2301, 2302. Masterpieces of Literature
2309. Patterns of Reports and Correspondence
3326. American Novel
3331. Short Story
4320. Modern American Drama
4341. Teaching English in Secondary Schools
4372. History of the English Language

Geography (GEOG)
2351. Regional Geography of the World

Geosciences
Geology (GEOL)
1308. Man and His Earth

Health, Physical Education, and Recreation
Health Education (HLED)
1301. Patterns of Healthful Living
2201. Chronic Disease and the Quality of Life
2202. Reducing the Risk of Communicable Disease

Recreation (REC)
3301. The Process of Recreation Programming
4308. Managing Leisure Services Organizations

History (HIST)
1300. Western Civilization I
1301. Western Civilization II
2300. History of the United States to 1877
2301. History of the United States since 1877
3310. History of Texas

Mass Communications (MCOM)
1300. Introduction to Mass Communications

Journalism (JOUR)
3350. History of American Journalism

Advertising (ADV)
3310. Principles of Advertising
3311. Principles of Public Relations

Mathematics (MATH)
1320. College Algebra
1321. Trigonometry
1330, 1331. Introductory Mathematical Analysis
1350. Analytical Geometry
1351. Calculus I
1352. Calculus II
1551. Analytical Geometry and Calculus I
1552. Analytical Geometry and Calculus II
2350. Calculus III

Political Science (POLS)
2301. American Government, Organization
2302. American Public Policy

Psychology (PSY)
1300. General Psychology
2301. Child Psychology
2302. Mental Health
2305. Adolescent Psychology
3306. Personality
3317. The Psychology of Learning
4305. Abnormal Psychology
4316. History of Psychology
4319. Human Learning

Sociology (SOC)
2301. Introduction to Sociology
2320. Current Social Problems
2331. The Sociology of Marriage
3361. Rural Sociology

College of Business Administration

Accounting (ACCT)
2300. Elementary Accounting I
2301. Elementary Accounting II

Finance (FIN)
2320. Personal Financial Planning and Investing
3320. Corporation Finance I
3323. Principles of Money, Banking, and Credit
3327. Life and Health Insurance
3332. Real Estate Fundamentals
4324. Investments

Information Systems and Quantitative Sciences (ISQS)
2445. Introduction to Business Statistics

Management (MGT)
3373. Managerial Communication
Marketing (MKT)
3350. Introduction to Marketing
Business Law (BLAW)
3391. Business Law I
3392. Business Law II
3395. Oil and Gas Law

College of Education

Educational Psychology (EPSY)
4314. History and Philosophy of Education
4324. Foundations of Educational Sociology
Early Childhood/Elementary Education (ECEL)
4350. Children's Literature

College of Home Economics

Family Management, Housing, and Consumer Science (FMHC)
1380. Introduction to Housing and Interiors
Food and Nutrition (F&N)
1301. Nutrition for Today
Home and Family Life
Family Relations (F R)
2322. Courtship and Marriage

Special Activities. Division staff members offer assistance in developing and facilitating noncredit conferences, institutes, workshops, and seminars as well as community short courses. Over 180 such programs were offered by Texas Tech faculty last year.

Admission

Requests for applications or questions concerning admission should be directed to the Admissions Office, Texas Tech University, Lubbock, Texas 79409, telephone (806) 742-3661.

Admission of Beginning Freshmen. To be admitted for the first time to Texas Tech, an applicant must meet certain standards. These include graduating from an accredited high school with required credits and making an acceptable score on either the Scholastic Aptitude Test (SAT) or the American College Test (ACT).

Students planning to enter engineering, science, or mathematics programs within the University are urged to complete high school geometry, algebra, and trigonometry. Also, strong backgrounds in chemistry and physics are desirable for those enrolling in engineering programs.

Prospective students are encouraged to choose electives such as computer science, economics, foreign language, advanced mathematics, public speaking and debate, science, and social science in their high school programs.

Freshman Admission Procedure. To apply for admission as a beginning freshman, an applicant takes the following steps:

1. Submits an application on forms furnished by the Admissions Office.
2. Provides the Admissions Office with an official high school transcript, which should include the applicant's rank in the high school graduating class. The applicant must assume the responsibility for having this record forwarded to the Admissions Office.

The deadline for applying for admission is August 15, but new students are urged to submit their applications and transcripts to the Admissions Office by July 15. If students desiring admission wait until after July 15 to file their applications, it may not be possible for the Admissions Office to notify them by mail of their

admission status. To gain early notification of acceptance, they should request their high school to forward copies of their transcripts after completing their junior year. These should be sent in after October 1 of the senior year. Tentative admission can then be granted pending graduation from high school. Upon graduation, an applicant for admission must submit a supplementary transcript showing final grades, graduation date, and rank in class. While an early application cannot assure preferential treatment, late applicants are more likely to have difficulty enrolling in certain areas for which there is a heavy demand.

3. Furnishes scores on the SAT or the ACT.

4. Files a health data form completed by a physician and forwarded to the University Health Center, Box 4049, Lubbock, Texas 79409. This form properly completed must be on file in the University Health Center before a student can be allowed to register. A prospective student does not, however, have to have this form on file in order to be considered for acceptance to Texas Tech.

When an applicant's file is complete, that is, after the completed application form and all necessary supporting transcripts and records have been received, the application will be evaluated. Normally the applicant will be notified of acceptance or rejection before he or she reaches the campus. This, of course, will be contingent upon all documents and forms having been received by the Admissions Office by July 15 for the fall semester or six weeks prior to the beginning of either the spring semester or the summer session.

Falsification or omission of application information will void admission to Texas Tech University.

Early Registration Conferences. Programs of academic advisement, registration, and orientation for beginning freshmen will be conducted during the summer. Their purpose is to assist beginning freshmen in making the transition to college. An invitation to participate in one of these programs will be extended to each freshman whose application is complete. All beginning freshmen are required to attend an Early Registration Conference or the fall freshman orientation conference.

Any student desiring academic advice or counseling prior to the regularly scheduled conferences or registration periods should consult with the appropriate academic dean.

Admission of International Students. Graduates of foreign secondary schools who have completed the equivalent of at least an American high school diploma may apply for admission to Texas Tech by writing to the Admissions Office. With the official application form, international applicants must furnish original documents, or official certified copies, indicating the nature and scope of their educational program. Students whose native tongue is not English must also present a score of at least 550 on the Test of English as a Foreign Language (TOEFL) unless they have graduated from a U.S. high school with a minimum of two years attendance. Information concerning the TOEFL may be obtained from Educational Testing Service, P.O. Box 899, Princeton, New Jersey 08540, U.S.A. Further testing will be given once the student arrives on campus to verify competency. Students lacking adequate English proficiency will be required to enroll in basic English courses.

International students who are not in the United States at the time of application should apply a year in advance. International students will not be admitted to

the University until they can prove their ability to support themselves financially (a minimum of $5,210 for the academic year in addition to travel money is necessary; this is subject to change if tuition, fees, or room and board charges are modified). The tuition rate for international students is $40 per semester hour.

A nonrefundable processing fee is required for all non-U.S. citizens who are not now permanent residents of the United States. Applicants for either undergraduate or graduate programs will not be considered unless their applications are accompanied by an International Money Order in the amount of $50 (U.S.), or U.S. Postal Money Order for applicants in the U.S., payable to Texas Tech University.

Admission of Transfer Students. Undergraduate students who have attended another accredited college may be accepted for admission to Texas Tech provided they meet certain requirements.

Students must apply for admission at least 30 days before the beginning of the semester. They must present official transcripts of their *entire* academic record from *all* institutions in which they have been or are enrolled. (The official transcript must have the signature of the proper college official and the impression of the raised college seal.)

A transfer student must be eligible to return to the institution from which he or she is transferring and must have a grade average of C or higher in all previous college work attempted or for each of the last two semesters of attendance provided he or she was a full-time student. Summer attendance of not fewer than 10 hours can be considered as one semester. All courses for which a student has enrolled are used in computing the grade-point average; however, one or two hour courses in band, choir, orientation, physical education, ROTC, etc., are not included in meeting the admission requirements. Students should refer to the appropriate college section for any specific requirements.

A student who has fewer than 15 semester hours of transfer credit or who has been enrolled for only a summer term or session must also submit scores from the SAT or ACT test and a high school transcript.

The student must have a minimum of 30 semester hours of transferable credit if he or she did not graduate from high school.

Students who do not meet the above requirements may be considered for admission by the Admissions Committee after the student has been out of college for a minimum of two long semesters. Such students would also be required to take the Transfer Test, registration for which is made through the Admissions Office. Arrangements must be made at least 45 days prior to the beginning of the semester.

Students who wish to apply for summer school need not submit a transcript but they must submit a letter of good standing from the last institution attended.

A former student of the University who has afterward attended another institution will be considered as a transfer student when applying for readmission and will be required to meet the standards for such students.

Admission of Graduate Students. Full details of admission requirements for those wishing to enter the graduate program at Texas Tech are published in the *Graduate Catalog*, which is issued annually. A copy may be secured from the Graduate Admissions Office. Those who wish to enter the graduate program in order to work toward a master's or doctor's degree will be required to take the

Aptitude Test of the Graduate Record Examinations (GRE). GRE scores must be received before final decisions can be made concerning applications for admission to graduate degree programs.

Special Admission. The University may, under unusual or special circumstances, waive the admission requirements for a limited number of applicants.

A student who has not graduated from high school and who has not attended college may be considered for admission by the Admissions Committee provided the student's graduating class has been out of high school for at least one year.

Transfer of Credits from Other Colleges and Universities. In general, all credit hours with a grade of C or higher earned at another accredited institution will be accepted for transfer to Texas Tech University.

The number of credit hours acceptable for transfer from a junior college should not exceed one-half of the total number of hours required for a particular degree program. Work taken at a junior college cannot be transferred as upper-division (junior or senior) level credit. In some circumstances, however, the student's academic dean could allow the student to substitute in the degree plan a transferred lower-division course for a course of similar content which is offered as an advanced course at Texas Tech.

The academic dean of the college offering the program in which the student is enrolled has the authority for determining which transfer courses apply toward a particular degree program.

At the option of the academic dean, transferred courses with a grade of D or the equivalent may be considered for credit toward requirements for the degree. Transfer credit in physical education activity courses, or substitutes for them, is accepted to the extent that it meets degree requirements, but grade points accumulated in such courses cannot be applied to reduce a deficiency of grade points in other subjects.

Students from a nonaccredited institution who wish to transfer to Texas Tech University will be considered for admission at the discretion of the Admissions Committee. In the event that admission is approved, such students must validate all such transfer credits accepted by Texas Tech by earning at least a 2.00 grade-point average on the first 30 hours of residence work here. Students may be dropped at any time they fall below a 2.00 average during the first 30 semester hours of work at Texas Tech. Students inadmissible to Texas Tech at the time they were admitted to a nonaccredited institution must pass required testing before being admitted here.

Concurrent Attendance at Texas Tech and Other Institutions. A student registered at Texas Tech who wishes to register concurrently at another institution must obtain written approval from the academic dean at Texas Tech. This approval applies to all residence courses, extension courses, correspondence courses in progress elsewhere at the time of registration, and to those begun during the semester.

A student registered at another institution who wishes to enroll concurrently for credit at Texas Tech must have approval from the appropriate academic dean's office at Texas Tech.

In no case will concurrent registration which would result in enrollment beyond a normal load at this institution be permitted.

Undergraduate Credit by Examination. It is the general policy of the University to recognize academic achievement of students gained by means other than through performance in organized classes. Students will be given the opportunity to receive credit by special examination in all courses where proficiency may be practicably determined by examination.

Students may achieve a high level of proficiency in certain subject areas through advanced work in high school, participation in advanced placement programs, or independent study. The University strongly encourages such superior attainment, recognizes it for academic purposes, and permits students who have done such work to obtain course credit through examination. A grade of Pass (P) will be given on the examination to those earning credit, but the grade will not be considered in determining grade-point averages. Course credit earned by examination is recorded by the Registrar on the student's transcript as "(Number) hours of credit via credit by examination program in (course equivalent)," and no grade points are awarded. Course credit by examination may not be used to satisfy the 30-hour minimum residence credit requirement for graduation. The student is responsible for complying with the following procedures:

1. The student is responsible for having test scores sent to the Admissions Office unless tests are taken at Texas Tech University. Score reports from other university test centers must be requested from the Testing and Evaluation Division, Room 213, West Hall. The student is responsible for completing tests for lower-level courses in sufficient time to qualify for registering for higher-level courses.
2. New students at Texas Tech may attempt credit by examination for degree credit during their freshman and sophomore years.
3. Transfer students with more than 66 transferable credit hours may attempt credit by examination until the end of their first long semester at Texas Tech.
4. Juniors and seniors or students in their third and fourth years at Texas Tech may attempt credit by examination for degree credit in freshmen and sophomore courses only upon written approval from their academic dean's office.
5. After the 12th class day, credit by examination may be attempted for a course one is enrolled in *only* upon written approval of the appropriate academic dean's office.
6. Credit by examination may be attempted for a course with the same specific sub-subject area as a more advanced course in the same specific sub-subject area completed in the classroom *only* upon written approval of the appropriate academic dean's office.

Credit earned will be awarded when the student enrolls at the University and when the student completes 12 credit hours at Texas Tech.

There are four separate programs by which a student may earn course credit by examination. These include (1) specified CEEB Achievement Tests, (2) CEEB Advanced Placement Examinations which are a part of the Advanced Placement Programs (APP) available in a limited number of secondary schools, (3) specified subject examinations of the CEEB College Level Examination Program (CLEP), and (4) departmental examinations prepared, administered, and scored by faculty members who teach the related course.

The student is responsible for taking the tests early enough to allow sufficient time for scores to be reported to the University and processed by the Admissions Office. Many courses in the credit by examination program are prerequisites for higher level courses; therefore, students seeking credit by examination must plan ahead so that this credit can be assured before registering for advanced courses. Without prior approval of their academic dean's office, students may not receive credit by examination for a course if they have already passed a more advanced course in the same subject area. The deadline for registering to take the CEEB Achievement and CLEP examinations at a national testing center is four to six weeks before the scheduled test. The deadline for registering for credit-by-examination testing at Texas Tech is five working days prior to the date of the test. Generally, test results or scores are mailed four to five weeks after the test date. Information regarding test dates and fees for national standardized examinations is available from the Testing and Evaluation Division at Texas Tech. It is the student's responsibility to request that his or her CEEB test scores be sent to the University. Information concerning each of the testing programs follows.

1. *Credit for CEEB Achievement Tests.* The CEEB Achievement Tests are part of the CEEB Admissions Testing Program. Each year there are several national administrations of the CEEB Achievement Tests. Students should plan to take the specified tests at national testing centers during their senior year of high school at an early testing date in order that scores may be reported to the University by June. In addition to the national administrations, there are administrations of the Achievement Tests recognized for credit by Texas Tech during the Early Registration Conferences held on the campus each summer.

Further information concerning the CEEB Achievement Tests may be obtained from your high school counselor or principal, the College Entrance Examination Board, Box 592, Princeton, New Jersey 08540, or the Testing and Evaluation Division of Texas Tech University, Box 4160, Lubbock, Texas 79409.

2. *Credit for CEEB Advanced Placement Program Examinations (APP).* The Advanced Placement Examination is the final examination for a nationally standardized course offered in a limited number of secondary schools under the auspices of the CEEB Advanced Placement Program. The objective of the APP is to allow students to begin work toward college credit while still in high school. Students should check with their high school counselor or principal as to the availability of the APP examinations in their school. The APP is offered once a year during May at participating high schools.

3. *Credit for CEEB College Level Examination Program (CLEP) Examinations.* Under the College Level Examination Program, the University will award credit for only the specified examinations. As with the other CEEB testing programs, a student may attempt a CLEP examination at a national CLEP testing center before enrolling and have the scores reported to the University. These examinations are offered on the campus during the Early Registration Conferences held each summer, several times each year to students currently enrolled, and monthly at national CLEP test centers.

Further information concerning the CLEP tests may be obtained from your high school counselor or principal, College Level Examination Program, Box 1821, Princeton, New Jersey, 08540, or the Testing and Evaluation Division of Texas Tech University, Box 4160, Lubbock, Texas 79409.

4. *Credit by Departmental Examination.* Several departments within the University prepare, administer, score, and award credit for their own examinations. Credit for specific courses is given upon satisfactory performance of the comprehensive examinations which are administered by the departments responsible for the courses and recommended by the deans of the respective colleges. In order to be eligible to attempt credit by departmental examination, a student must not have previously audited, enrolled in, or attempted credit by examination in the course. A student must apply in writing to the responsible department at least 30 days prior to taking a departmental examination for credit. Further information regarding any credit by *departmental* examination should be secured directly from the academic department concerned.

TTU Courses for which credit can be earned	Standardized Test(s) Used	Min. Score	TTU Sem. Hrs.
Biology			
BIOL 1401, 1402	CEEB APP: Biology	3	8
BIOL 1401, 1402	CLEP-S: Biology	49	8
Business Administration			
ACCT 2300, 2301	CLEP-S: Introductory Accounting	50	6
ISQS 2340	CLEP-S: Computers and Data Processing	46	3
ISQS 2445	CLEP-S: Statistics	49	4
FIN 3323	CLEP-S: Money and Banking	48	3
MKT 3350	CLEP-S: Introductory Marketing	48	3
MGT 3370	CLEP-S: Introduction to Business Management	47	3
BLAW 3391	CLEP-S: Introductory Business Law	51	3
Chemistry			
CHEM 1305, 1306 & 1101, 1102	CEEB APP: Chemistry	3	8
CHEM 1305, 1306 & 1101, 1102	CLEP-S: General Chemistry	50	8
CHEM 1307, 1308 & 1103, 1104	CEEB APP: Chemistry	4	8
CHEM 1307, 1308 & 1103, 1104	CLEP-S: General Chemistry	65	8
Computer Science			
C S 1362	CLEP-S: Elem. Computer Programming: Fortran IV	50	3
Economics			
ECO 2311, 2312	CLEP-S: Introductory Micro- and Macro-economics	48	6
Education			
EPSY 3330	CLEP-S: Educational Psychology	47	3
EPSY 4387	CLEP-S: Tests and Measurements	46	3
English			
ENGL 1301	CEEB Achievement Test: English Composition	550	3
ENGL 1301, 1302	CEEB Achievement Test: English Composition	620	6
ENGL 1301	CLEP-S: College Composition	48	3
ENGL 1301, 1302	CLEP-S: College Composition	55	6
ENGL 1301	CEEB APP: English	3	3
ENGL 1301, 1302	CEEB APP: English	4	6
ENGL 1301, 1302	CLEP-G: English Aptitude	650	6
ENGL 1301, 1302	CLEP-G: Composite Aptitude	650	6
ENGL 1301, 1302	ACT: English Aptitude	28	6
ENGL 1301, 1302	ACT: Composite Aptitude	28	6

TTU Courses for which credit can be earned	Standardized Test(s) Used	Min. Score	TTU Sem. Hrs.
ENGL 1301, 1302	SAT: Verbal Aptitude	650	6
ENGL 2301, 2302	CLEP-S: Analysis and Interpretation of Literature	49	6
ENGL 2301, 2302	CLEP-S: English Literature	45	6
ENGL 3323, 3324	CLEP-S: American Literature	46	6
French			
FREN 3301	CEEB APP: French Literature	2	3
FREN 3301, 3302	CEEB APP: French Literature	4	6
German			
GERM 3301	CEEB APP: German	2	3
GERM 3301, 3302	CEEB APP: German	4	6
History			
HIST 1300, 1301	CEEB APP: European History	3	6
HIST 1300, 1301	CLEP-S: Western Civilization	50	6
HIST 2300	CEEB Achievement Test: American History-Social Studies	550	3
HIST 2300, 2301	CEEB APP: American History	3	6
HIST 2300, 2301	CEEB Achievement Test: American History-Social Studies	650	6
HIST 2300, 2301	CLEP-S: American History	50	6
Latin			
LAT 4302	CEEB APP: Latin, Prose	2	3
LAT 4305	CEEB APP: Latin, Vergil	2	3
Mathematics			
MATH 1320	CLEP-S: College Algebra	50	3
MATH 1321	CLEP-S: Trigonometry	49	3
MATH 1350	CEEB: Mathematics Achievement Test (MAT -- Level I or II)	650	3
MATH 1350, 1351	CEEB APP: Calculus AB *or* Calculus BC	3	6
MATH 1350, 1351	CLEP-S: Introductory Calculus	45	6
MATH 1350, 1351, 1352	CEEB APP: Calculus AB *or* Calculus BC	4	9
MATH 1350, 1351, 1352	CLEP-S: Introductory Calculus	50	9
Physics			
PHYS 1306, 1307 & 1103, 1104	CEEB APP: Physics B	3	8
PHYS 1308, 1105	CEEB APP: Physics C	3	4
Political Science			
POLS 2301	CLEP-S: American Government	47	3
Psychology			
PSY 1300	CLEP-S: General Psychology	50	3
PSY 2301	CLEP-S: Human Growth and Development	50	3
Spanish			
SPAN 3301	CEEB APP: Spanish	2	3
SPAN 3301, 3302	CEEB APP: Spanish	4	6

CEEB APP = College Entrance Examination Board Advanced Placement Program

CEEB = College Entrance Examination Board College Placement Tests or Achievement Tests

CLEP-G = College Level Examination Program — General Exams

CLEP-S = College Level Examination Program — Subject Exams

Registration

Each semester and summer term opens with a registration period during which the formal process of enrollment in the University is completed. Prior to registering for each semester or summer term, every student who completes the admission process is notified of his or her admission to the University and is furnished additional materials which deal with the actual registration.

Scholastic Order for Registration. Priority for time of registration is based upon the student's last name and classification. To provide equity in registration time assignments, students' names will be rotated alphabetically each long semester. Scholastic order for registration will apply to new students, transfer students, and current students. Graduate students may register at their convenience.

Exceptions to any of the assigned registration times cannot be made.

Matriculation Number. Generally, the student's social security number is used for matriculation and record identification purposes. However, disclosure of the social security number for these purposes is voluntary. Any student who chooses not to use the social security number in this manner will be assigned a matriculation number by the University.

Stop Enrollment. Insufficient information or improper information given by the student on any admission or registration form will constitute cause for delaying the admission or enrollment for the student.

Name Change. Students who have a change in name after their last registration must notify the Registrar's Office prior to the ensuing registration to be effective for that semester of enrollment. A student may not register under a name different from that used during the last enrollment without completing the change of name form. All grade reports and transcripts are issued under the student's legal name as recorded in the Registrar's Office.

Registration of Undergraduate Students in Graduate Courses. An undergraduate student who is within 12 semester hours of graduation and who has at least a B average in the major subject may enroll for courses carrying graduate credit, subject to the approval of the dean of the academic college and the Dean of the Graduate School. This approval must be obtained on special forms at the time of registration. No course taken without this approval may be counted for graduate credit. Graduate work taken under this provision may not be used to meet undergraduate degree requirements.

Unless he or she has previously taken the Aptitude Test of the Graduate Record Examinations, an undergraduate student who is permitted to enroll for graduate credit as indicated above is required to take the test at the first administration of it after enrolling for graduate work.

The maximum course load which may be carried by an undergraduate taking courses for graduate credit is 16 credit hours in a semester or 6 hours in a summer term. An undergraduate may not accumulate more than 12 semester hours for graduate credit before being admitted to the Graduate School. Undergraduates permitted to enroll for graduate credit are expected to complete all of their undergraduate requirements within the academic year in which they first enroll for graduate credit.

It is the responsibility of the student to obtain the necessary forms and to follow prescribed procedure in registering for any course. An undergraduate stu-

dent who enrolls in a course for graduate credit without obtaining proper approval will be dropped from that course.

Change of Schedule. With proper approval, a student who wishes to request a change in schedule prior to the beginning of the semester may do so at no cost. Students wishing to request a change in schedule beginning the first day of class will be assessed a $3 processing fee. The University reserves the right to make changes in a student's schedule, for which no fee is assessed.

Student-initiated changes in schedule, including adding and dropping courses, must be arranged by the student in person; changes are not official until all steps in the process have been completed.

Enrollment Without Credit. Persons who wish to audit a course for no grade must obtain written permission from the dean of the college in which the course is offered. Those who audit a course do so for the purpose of hearing or seeing only; they do not have the privilege of participating in class discussions or laboratory or field work, of turning in papers, or of receiving a grade or credit in the course. Students who audit a course will not be listed on the class roll, and no notation of the audit will be made on the student's transcript.

Students who are enrolled for 12 semester hours or more may audit a course without paying an additional fee. Persons who are enrolled for fewer than 12 hours must pay a $10 fee for auditing a course.

Registration of Part-Time Students. Persons who wish to take evening classes and who plan to register for no more than 6 semester credit hours are eligible to enroll during a special registration conducted by the Registrar and Continuing Education. Information may be obtained from either office.

Finances

The principal business offices of the University are those of the Vice President for Finance and Administration, Associate Vice President for Business Affairs, Comptroller, Budget Officer, and Contracting Officer.

The Vice President for Finance and Administration is the executive in charge of all fiscal operations of the University.

The Associate Vice President for Business Affairs oversees the operations of the offices of the Comptroller, Accounting Services, Contracting, and Purchasing.

The Comptroller is responsible for collecting, depositing, and disbursing all funds received by the University. The collections and deposits are handled by the Bursar and staff, and funds are disbursed through the Payroll and Accounting departments.

The Budget Office provides staff support in the development and execution of the University's budgets and financial plans.

The Contracting Officer is responsible for writing or reviewing contracts, for all purchasing, for property and liability insurance management, and other duties.

Fee Payment. *Student registration is not complete and enrollment is not official until tuition and fees are paid in full.*

It is the student's responsibility to insure that payments for tuition and fees are received in the Bursar's Office by the University-established deadline announced each semester to avoid cancellation of registration.

Effective with the 1983-84 academic year, students taking advantage of the new registration system will receive bills for their tuition and fees by mail prior to the beginning of each fall and spring semester. Bills for summer tuition and fees will not be mailed. Students should refer to the *Summer Schedule of Classes* for details concerning summer school payment procedures.

Bills for the fall semester will be mailed approximately July 1, and bills for the spring semester will be mailed approximately December 1. Students registering after these dates each semester must pay fees in person on the day of their registration to complete the registration process and to avoid cancellation.

Students receiving bills by mail must insure that payment for the total amount of their tuition and fees, accompanied by a copy of the student's bill, is received in the Bursar's Office on or before August 1 for the fall semester and on or before January 1 for the spring semester. Partial payments will not be accepted.

Failure to receive full payment in the Bursar's Office by these deadlines will result in cancellation of the student's registration. Reminder notices will not be mailed prior to cancellation. Classes originally registered for will be lost by the student. The student has the option of starting the registration process again, but there is no assurance that the same class schedule will be available. The new registration system is not capable of reinstating a student's original registration schedule if it is cancelled.

It is the student's responsibility to insure that his or her address is correct and current each semester. All address changes should be handled through the Registrar's Office. The University cannot be responsible for cancellation of a student's registration due to mail problems.

Students allowed to register during the first week of classes will be charged a $15 late registration fee and an escalating late payment fee based on the date of payment.

Payments by mail may be made by personal check, cashier's check, or money order payable to Texas Tech University. Cash payments should not be sent through the mail. Cash payments should be made in person at the Bursar's Office. All checks and money orders are accepted subject to final payment. A returned check given in payment of tuition and fees will result in cancellation of the student's registration if not redeemed within the deadline specified in the notification letter. A returned check charge will be assessed.

Students should refer to the *Schedule of Classes* published each semester for more detailed and updated registration and payment procedures.

Texas Tech University reserves the right, without notice in this catalog, to change, amend, add to, or otherwise alter any or all fees, rates, or other changes set forth herein by action of the Board of Regents of Texas Tech University or the Texas State Legislature as the case may be.

Summary of Student Expenses. Every student is necessarily concerned about expenses while attending college. In a large student body such as that at Texas Tech University, there are so many different tastes, as well as such a wide range of financial resources, that students must determine their own budgets in keeping with their own needs and financial condition. It is possible to live simply and participate in the life of the college community on a modest budget. University authorities can offer their best help to students in their budget planning by furnishing information about certain definite items of expense and acquainting them with others for which in all probability they will have to make provision.

To enable the resident student to approximate expenses at the time of entering college, the following estimates, based on a 15-hour load, are offered:

	Fall	Spring
Tuition Fee	$ 60	$ 60
Laboratory Fees	4	4
Building Use Fee	90	90
Student Services Fee	60	60
University Center Fee	15	15
ID Card Fee	1	1
General Property Deposit (new student)	10	
Books and Incidentals (estimated)	150	125
Total	$390	$355

For estimated costs, including residence hall room and board, add charges for the proper residence hall as shown in the section entitled "Room and Board Charges."

The cost of books and supplies will vary with the different curricula of the University. Engineering students are required to purchase their own drawing equipment, calculators, etc.

Tuition Fees.

Tuition Fee for Resident Students: For legal resident students of the state of Texas the tuition fee, each semester, is $4 per semester hour, but the total of such charge shall not be less than $50.

Tuition Fee for Nonresident Students: For nonresident students the tuition fee, each semester, is $40 per semester hour.

Tuition Fee for Foreign Students: For foreign students the tuition fee, each semester, is $40 per semester hour.

Interpretations of Residence. It is the duty of each student to register under the proper residence and pay the correct tuition fees. The explanation below of what constitutes a nonresident is intended to assist students in properly determining whether or not they qualify as residents of the state for tuition purposes. If there is any possible question whether or not a student qualifies as a resident of Texas, he or she should consult the Office of Admissions. For each improper registration there may be a penalty of $10 in addition to the proper fee. There can be no change in residence status except upon express authorization by the office of admissions. *The following State Statutes and Coordinating Board's Rules and Regulations for Determining Residence Status are subject to change respectively by the State Legislature and the State Coordinating Board without notice.*

Rules and Regulations for Determining Residence Status Pursuant to Title 3, Texas Education Code. Effective July 15, 1981.

Minors

Statute: Section 54.052(a)(3) "Dependent" means an individual who is claimed as a dependent for federal income tax purposes by the individual's parent or guardian at the time of registration and for the tax year preceding the year in which the individual registers.

Section 54.052(c) An individual who is under 18 years of age or is a dependent and who is living away from his family and whose family resides in another state or has not resided in Texas for the 12-month period immediately preceding the date of registration shall be classified as a nonresident student.

Section 54.052(d) An individual who is 18 years of age or under or is a dependent and whose family has not resided in Texas for the 12-month period immediately preceding the date of registration shall be classified as a nonresident student, regardless of whether he has become the legal ward of residents of Texas or has been adopted by residents of Texas while he is attending an educational institution in Texas, or within a 12-month period before his attendance, or under circumstances indicating that the guardianship or adoption was for the purpose of obtaining status as a resident student.

Section 54.055 An individual who is 18 years of age or under or is a dependent and whose parents were formerly residents of Texas is entitled to pay the resident tuition fee following the parents' change of legal residence to another state, as long as the individual remains continuously enrolled in a regular session in a state-supported institution of higher education.

Death or Divorce of Parents. The legal residence of minors under 18 years of age is usually that of the father. Upon the death of the father, the legal residence of minors is that of the mother. Upon divorce or legal separation of the parents, the residence of the minors is determined by the residence of the parent with whom they are residing at the time of registration.

Custody by Court Order. If the custody of minors has been granted by court order (e.g., divorce decree, child custody action, guardianship or adoption proceedings) to some person other than the parents, the residence of that person will control; provided, however, that such grant of custody was not ordered during or within a year prior to their enrollment in an institution of higher education (defined as any public junior college, public senior college or university, medical or dental unit or other agency of higher education) and was granted under circumstances indicating that such guardianship was not for the purpose of obtaining status as resident students.

If minors are not residing with either parent and there is no court-appointed guardian, the residence of the parent with whom they last resided will be presumed to control. If, however, the minors resided with and have been dependent upon a grandparent for more than a year prior to enrollment in an institution of higher education, the residence of that natural guardian will be regarded as the minors' residence. The residence of a person other than a parent or a natural or legal guardian who may furnish funds for payment of tuition, fees, or living expenses will in no way affect the residence classification of minors.

Abandoned Child. In the case of an abandoned child, the residence of persons who have stood *in loco parentis* for a period of time may determine the residence classification. The fact of abandonment must be clearly established and must not have been for the purpose of affecting the residence of minors. They must have actually resided in the home of such person for two years immediately prior to registering in an institution of higher education in Texas, and such person must have provided substantially all of their support. In the event that the *in loco parentis* relationship has not existed for the full two-year period, a lesser period of time is acceptable in unusual hardship cases, such as death of both parents.

Orphans. Orphans who have lived for longer than a year in an established orphans' home in Texas operated by a fraternal, religious, or civic organization and have been graduated from the orphans' home will be considered residents of Texas provided they remain in Texas from the time of such graduation until they enter an institution of higher education.

Emancipated Child. Under certain circumstances, minors may become emancipated or freed from parental control. If their parents have ceased to exercise parental control and responsibility, if they are responsible for all of their own decisions and affairs, and if they are financially independent of parents, minors may establish emancipation. Minors are financially independent if they are not claimed as dependents for federal income tax purposes by parents or guardians at the time of registration and for the tax year preceding the year in which they register. If emancipation is clearly proved, the residence classification of minors is determined by their own residence rather than the residence of the parents. After

12 months in Texas under such circumstances, minors may be classified as residents if they otherwise satisfy the statutory requirements applicable to those over 18 (e.g., see presumption arising from residence while a student). Proof of emancipation is the responsibility of the minors.

Married Minors. Minors who are married have the power and capacity of single persons of full age and are entitled to select their own place of legal residence. After 12 months' residence in Texas under such circumstances, minors may be classified as residents if they otherwise satisfy the statutory requirements applicable to those over 18 years of age. The residence classification for tuition purposes of nonresidents who marry Texas residents will be governed by the provisions of the tuition statute (Texas Education Code, Section 54.506) and of these rules and regulations as hereinafter set out.

Minors Whose Parents Moved to Another State or Foreign Country. If the parents of minors who are enrolled as resident students move their legal residence to another state or foreign country, the minors will be classified as nonresidents at all subsequent registration periods. Under the provisions of Section 54.055, the minors will be entitled to pay the resident tuition fee as long as they remain continuously enrolled in a regular session in a public institution of higher education. The minor students must re-enroll for the next available regular semester immediately following the parents' change of legal residence to another state.

If the parents of minors move to another state or foreign country or reside outside the state or in a foreign country at the time the minors enroll in an institution of higher education, but claim legal residence in Texas, conclusive evidence must be presented that the father is still claiming legal residence in the State of Texas and that he has the present intent to return to the state. A certificate from the employer of the parents that the move outside the state was temporary and that there are definite plans to return the parents to Texas by a determinable future date may be considered in this connection.

If minors whose parents have moved their legal residence to another state or foreign country reside in Texas for 12 consecutive months following their 18th birthday and intend to establish permanent residence in the state, the minors may be classified as resident students effective with the beginning of the term or semester following their 19th birthday, despite the fact that the minors' entire periods of residence in Texas have been as students.

When the parents of minors who have established their legal residence in another state or foreign country return and reestablish their legal residence in Texas, the minors must be classified as nonresidents until the first registration after the parents have resided in the state for a 12-month period.

Individuals Over 18

Statute: Section 54.052(e) An individual who is 18 years of age or over who has come from outside Texas and who is gainfully employed in Texas for a 12-month period immediately preceding registration in an educational institution shall be classified as a resident student as long as he continues to maintain a legal residence in Texas.

Section 54.052(f) An individual who is 18 years of age or over who resides out of the state or who has come from outside Texas and who registers in an educational institution before having resided in Texas for a 12-month period shall be classified as a nonresident student.

Section 54.052(g) An individual who would have been classified as a resident for the first five of the six years immediately preceding registration, but who resided in another state for all or part of the year immediately preceding registration, shall be classified as a resident student.

Section 54.054 A nonresident student classification is presumed to be correct as long as the residence of the individual in the state is primarily for the purpose of attending an educational institution. After residing in Texas for at least twelve (12) months, a nonresident student may be reclassified as a resident student as provided in the rules and regulations adopted by the Coordinating Board, Texas College and University System. Any individual reclassified as a resident student is entitled to pay the tuition fee for a resident of Texas at any subsequent registration as long as he continues to maintain his legal residence in Texas.

Establishment of Residence. Individuals 18 years of age or over who move into the state and who are gainfully employed within the state for a period of 12 months prior to enrolling in an educational institution (defined as any institution of higher education, public or private, above the high school level) are entitled to classification as residents. If such 12 months' residence, however, can be shown not to have been for the purpose of establishing legal residence in the state but to have been for some other purpose, the individuals are not entitled to be classified as residents. Any students registering in an educational institution prior to having resided in the state for 12 months immediately preceding registration will be classified as nonresidents for tuition purposes.

Dependents over Eighteen. Any individuals 18 years of age or over who are claimed as dependents for federal income tax purposes by their parents or guardians at the time of registration and for the tax year preceding the year in which they register will be classified for tuition determination purposes as though they were minors.

Reestablishment of Residence. Persons who resided in Texas for at least five years prior to moving from that state, and who have returned to the state for residence purposes before having resided out of the state for a year, will be classified as residents.

Reclassification. Persons classified as nonresident students upon first enrollment in an institution of higher education are presumed to be nonresidents for the period during which they continue as students. If such nonresident students withdraw from school and reside in the state while gainfully employed for a period of 12 months, upon reentry into an institution of higher education they will be entitled to reclassification as residents for tuition purposes. Accumulations of summer and other vacation periods do not satisfy this requirement. Reclassification to residence status after residing in the state for 12 months cannot be based solely upon the students' or the students' spouses' employment, registration to vote, registration of a motor vehicle and payment of personal property taxes thereon, or the securing of a Texas driver's license. The presumption of a "nonresident" is not a conclusive presumption, however, and other facts may be considered to determine if the presumption has been overcome. Material to this determination are business or personal facts or actions unequivocally indicative of a fixed intention to reside permanently in the state. Such facts may include, but are not limited to, the length of residence and full-time employment prior to registering in the institution, the fact of full-time employment and the nature of such employment (regular-type employment) while a student, purchase of a homestead with substantial down payment, dependency upon a parent or guardian who has resided in Texas for at least 12 months immediately preceding the student's registration, and marriage to a resident of Texas. All of these facts are weighed in light of the fact that a student's residence while in school is primarily for the purpose of education and not to establish residence, and that decisions of an individual as to residence are generally made after the completion of an education and not before.

Married Students

Statute: Section 54.056 A nonresident who marries and remains married to a resident of Texas, classified as such under this Act at the time of the marriage and at the time the nonresident registers, is entitled to pay the resident tuition fee regardless of the length of time he has lived in Texas, and any student who is a resident of Texas who marries a nonresident is entitled to pay the resident tuition fee as long as he does not adopt the legal residence of the spouse in another state.

Nonresident Who Marries A Resident of Texas. The nonresident student who marries a resident of Texas is entitled to pay resident tuition at the first registration period following the date of marriage upon submission of evidence of such marriage and of the spouse's legal residence in Texas. Such evidence is a certified copy of the marriage license or other certified documentary evidence of marriage as filed with the county clerk. The legal residences of a husband and wife are normally presumed to be the same; however, it is possible for either the husband or wife to establish a separate residence. In such a situation, the normal standards are followed. In the event a nonresident student marries a resident of Texas and subsequently is divorced within 12 months, such nonresident student will be classified as a nonresident for all enrollment periods subsequent to the date of the divorce. The nonresident, however, may establish Texas residence pursuant to normal standards.

Military Personnel and Veterans

Statute: Section 54.058(a) Military personnel are classified as provided by this section in the following manner:

(b) An officer, enlisted man or woman, selectee or draftee of the Army, Army Reserve, Army National Guard, Air National Guard, Texas State Guard, Air Force, Air Force Reserve, Navy, Navy Reserve, Marine Corps, Marine Corps Reserve, Coast Guard, or Coast Guard Reserve of the United States, who is assigned to duty in Texas is entitled to register himself, his spouse, and their children in a state institution of higher education by paying the tuition fee and other fees or charges required of Texas residents, without regard to the length of time he has been assigned to duty or resided within the state. However, out-of-state Army National Guard or Air National Guard members attending training with Texas Army or Air National Guard members under National Guard Bureau regulations may not be exempted from nonresident tuition by virtue of that training status nor may out-of-state Army, Air Force, Navy, Marine Corps, or Coast Guard Reserve training with units in Texas under similar regulations be exempted from nonresident tuition by virtue of such training status. It is the intent of the legislature that only those members of the Army or Air National Guard, Texas State Guard, or other reserve forces mentioned above be exempted from the nonresident tuition fee and other fees and charges only when they become members of Texas units of the military organizations mentioned above.

(c) As long as they reside continuously in Texas, the spouse and children of a member of the Armed Forces of the United States who has been assigned to duty elsewhere immediately following assignment to duty in Texas are entitled to pay the tuition fees and other fees or charges provided for Texas residents.

(e) A Texas institution of higher education may charge to the United States Government the nonresident tuition fee for a veteran enrolled under the provisions of a Federal law or regulation authorizing educational or training benefits for veterans;

(f) The spouse and children of a member of the Armed Forces of the United States who dies or is killed are entitled to pay the resident tuition fee, if the wife and children become residents of Texas within 60 days of the date of death; and

(g) If a member of the Armed Forces of the United States is stationed outside Texas and his spouse and children establish residence in Texas by residing in Texas and by filing with the Texas institution of higher education at which they plan to register a letter of intent to establish residence in Texas, the institution of higher education shall permit the spouse and children to pay the tuition, fees, and other charges provided for Texas residents without regard to length of time that they have resided within the State.

Certification of Assignment to Duty in Texas. Subsection (b) provides that military personnel assigned to duty within the State of Texas, their spouses and their dependent children will be entitled to pay the same tuition as a resident of Texas regardless of the length of their physical presence in the state. To be entitled to pay the resident tuition fees, such military personnel must submit at the time of each registration a statement from their commanding officer or personnel officer certifying that they are then assigned to duty in Texas and that same will be in effect at the time of such registration in an institution of higher education. This subsection also provides that nonresident members of an out-of-state National Guard unit who are temporarily training with a Texas National Guard unit will not be entitled to pay the resident tuition.

Spouses and Children of Members of Armed Services. Subsection (c) provides that the spouses and dependent children of members of the armed forces assigned to duty outside the State of Texas immediately after assignment in Texas may be entitled to pay the resident tuition as long as they reside continuously in Texas.

Subsection (g) provides that the spouses and dependent children of members of the armed forces who are assigned to duty outside the State of Texas may be entitled to pay the resident tuition if they reside in Texas and file with the institution of higher education at which a child or spouse plans to register a letter of intent, an affidavit, or other evidence satisfactory to the institution stating they intend to become permanent residents of Texas.

Subsection (f) provides that members of the immediate family (which includes spouses or dependent children) of members of the armed forces who die or are killed in action while

in military service may qualify to pay the resident tuition if they become residents of Texas within 60 days of the date of death. To qualify under this provision, the students must submit to the institution of higher education satisfactory evidence establishing the date of death and residence in Texas.

The military personnel spouses and dependent children enumerated in (b), (c), (f), and (g) are classified as nonresidents but will be entitled to pay the resident tuition regardless of their length of residence in Texas if they comply with the provisions of the statute and these rules and regulations.

Nonresidents Attending College Under Federal Benefits Programs for Veterans. Subsection (e) provides that the institution of higher education may charge the nonresident tuition fee for nonresident veterans to the United States government under the provisions of any federal law or regulation authorizing educational or training benefits for veterans.

Legal Residence of Persons in Military Service. Persons in military service are presumed to maintain during their entire period of active service the same legal residence that was in effect at the time of entering military service. Persons stationed in a state on military service are presumed not to establish a legal residence in that state because their presence is not voluntary but under military orders. It is possible for members of the military service to abandon the domicile of original entry into the service and to select another, but to show establishment of a new domicile during the term of active service there must be clear and unequivocal proof of such intent. An extended period of service alone is not sufficient. The purchase of residential property is not conclusive evidence unless coupled with other facts indicating an intent to put down roots in the community and to reside there after termination of military service. Evidence that will be considered in determining this requisite intent includes, but is not limited to, a substantial investment in a residence and the claiming of a homestead exemption thereon, registration to vote and voting in local elections, registration of an automobile in Texas and payment of personal property taxes thereon, obtaining a Texas driver's license, maintaining checking accounts, savings accounts, and safety deposit boxes in Texas banks, existence of wills or other legal documents indicating residence in Texas, change of home-of-record and designation of Texas as the place of legal residence for income tax purposes on military personnel records, business transactions or activities not normally engaged in by military personnel, membership in professional or other state organizations, and marriage to a resident of Texas. Purchase of property during terminal years of military service preceding retirement generally is given greater weight than a similar purchase made prior to such terminal period.

Residence Classification of Veterans Upon Separation from Military Service. Persons who enroll in an institution of higher education following separation from military service must be classified as nonresident students unless (1) they were legal residents of Texas at the time of entry into military service and have not relinquished that residence, (2) they can prove that during military service they have, in fact, established bona fide, legal residence in Texas at least 12 months prior to registration, or (3) they have resided in Texas other than as students for 12 months prior to registration and subsequent to discharge from service. The nonresident classification is a presumption, however, that can be overcome pursuant to the guidelines and standards for establishing Texas residence.

Faculty and Staff

Statute: Section 54.059 A teacher, professor, or other employee of a Texas institution of higher education is entitled to register himself, his spouse, and their children in a state institution of higher education by paying the tuition fee and other fees or charges required for Texas residents without regard to the length of time he has resided in Texas. A teacher, professor, or other employee of a Texas institution of higher education is any person employed at least one-half time on a regular monthly salary basis by a state institution of higher education.

Persons employed at least half time on a regular monthly salary basis (not hourly employees) by any public institution of higher education, with an effective date of employment on the 12th class day of a regular semester or the 4th class day of a summer term, may pay the same tuition as a resident of Texas for themselves, their spouses, and their dependent children, regardless of the length of residence in the state. To be entitled to pay the

resident tuition fees, such employees must submit, prior to the time of each registration, a statement certifying employment from the Director of Personnel or a designated representative of the institution of higher education by which they are employed.

Student Employees

Statute: Section 54.051(o) A teaching assistant, research assistant, or other student employee of any institution covered by this section is entitled to register himself, his spouse, and their children in a state institution of higher education by paying the tuition fees and other fees or charges required for Texas residents, without regard to the length of time he had resided in Texas; provided that said student employee is employed at least one-half time in a position which relates to his degree program under rules and regulations established by the employer institution. This exemption shall continue for students employed two consecutive semesters through the summer session following such employment if the institution is unable to provide employment and, as determined under standards established by the institution, if the employee has satisfactorily completed his employment.

Students employed at least half time by any public institution of higher education in a degree-program-related position, with an effective date of employment on or before the 12th class day of a regular semester or the 4th class day of a summer term, may pay the same tuition as a resident of Texas for themselves, their spouses, and their dependent children, regardless of the length of residence in the state. The institution that employs the students will determine whether or not the students' jobs relate to their degree programs. If students are employed by an institution of higher education for consecutive Fall and Spring semesters and were eligible to pay the tuition charged to Texas residents during those Fall and Spring semesters because of the provisions of this subsection, then the students may continue to pay the resident tuition rate during the summer session following the Spring employment if the institution is unable to provide employment and if the students' employment was satisfactorily completed.

Scholarships

Statute: Section 54.051(p) A student who holds a competitive scholarship of at least $200 for the academic year or summer for which he is enrolled and who is either a nonresident or a citizen of a country other than the United States of America is entitled to pay the fees and charges required of Texas residents without regard to the length of time he has resided in Texas, provided that he must compete with other students, including Texas residents, for the scholarship and that the scholarship must be awarded by a scholarship committee officially recognized by the administration of the institution of higher education.

An official scholarship committee or committees of a public institution of higher education may award competitive scholarships in amounts of $200 or more for the academic year, the summer session or both. If nonresidents or foreign students, in competition with other students, including Texas residents, obtain these competitive scholarships, the students may pay the same tuition as a resident of Texas during the registration period in which the scholarship is in effect. The students must present a statement from the official scholarship committee certifying the period of time during which the scholarship will be in effect.

Reciprocity

Statute: Section 54.060 Resident of Bordering State: Tuition. The nonresident tuition fee prescribed in this chapter does not apply to a nonresident student who is a resident of a state situated adjacent to Texas and who registers in any Texas public junior college situated in a county immediately adjacent to the state in which the nonresident student resides. The nonresident junior college student described in this section shall pay an amount equivalent to the amount charged a Texas student registered at a similar school in the state in which the nonresident student resides. The nonresident student described in this section shall pay equivalent fees and charges to those charged Texas students registered at a similar institution in the state in which the nonresident student resides, when such student registers at a Texas public senior upper-level (those institutions offering only junior, senior, and graduate-level programs) institution of higher

education, located within the Texas public junior college district from which the nonresident student has graduated or completed 45 semester credit hours.

Nonresidents who are residents of a state of the United States bordering Texas are entitled to pay Texas resident rates upon registering in any Texas public junior college if the district of such college includes any part of a county that is immediately adjacent to the state in which the nonresidents reside, provided that Texas residents are entitled to pay in-state fees and charges at a similar school in the bordering state.

Nonresident students described in this rule will be entitled to pay Texas resident rates at a Texas public senior upper-level institution of higher education (those institutions offering only junior, senior, and graduate-level programs) that is located within the Texas public junior college district from which the nonresident students have graduated or completed 45 semester credit hours, provided that Texas residents are entitled to pay in-state fees and charges at a similar institution in the bordering state.

Tuition Waivers

Statute: Section 130.003(b) (4) . . . the governing board of a public junior college district may waive the difference in the rate of tuition for nonresident and resident students for a person, and his dependents, who owns property which is subject to ad valorem taxation by the junior college district . . .

The governing board of a public junior college district may waive the difference in the rate of tuition for nonresident and resident students for individuals or their dependents who own property subject to ad valorem taxation by the junior college district. Persons or their dependents applying for such waiver must verify property ownership by presentation of an ad valorem tax statement or receipt issued by the tax office of the junior college district; or by the presentation of a deed, property closing statement, or other appropriate evidence of ownership of property that is subject to ad valorem taxation by the junior college district. If a sworn affidavit is accepted at the time of registration, verification of the students as ad valorem taxpayers must be provided by the end of the semester of enrollment.

Foreign Students

Statute: Section 54.057 An alien who is living in this country under a visa permitting permanent residence or who has filed with the proper federal immigration authorities a declaration of intention to become a citizen has the same privilege of qualifying for resident status for fee purposes under this Act as has a citizen of the United States. A resident alien residing in a junior college district located immediately adjacent to Texas boundary lines shall be charged the resident tuition by that junior college.

Aliens living in the United States under a visa permitting permanent residence or who have filed with the proper federal authorities a declaration of intention to become a citizen have the same privilege of qualifying for Texas resident status for tuition purposes as do citizens of the United States.

Responsibilities

Student Responsibility to Register Under Proper Classification. The responsibility of registering under the proper residence classification is that of the students. If there is any question as to right to classification as a resident of Texas, it is the students' obligation, prior to or at the time of registration, to raise the question with the administrative officials of the institution in which they are registering for official determination.

Notification Upon Becoming a Nonresident. Students classified as resident students who become nonresidents by virtue of a change of legal residence by their own action or by the persons controlling their domicile are required to notify the proper administrative officials of their institution at once.

Reclassification

Application for Reclassification. Students classified as nonresident students will be considered to retain that status until they make written application for reclassification in the form prescribed by the institution and are officially reclassified in writing as residents of Texas by the proper administrative officers of the institution.

Reclassification as a Nonresident. Persons who have been classified as residents of Texas will be reclassified as nonresident students whenever they report, or there is found to exist, circumstances indicating a change in legal residence to another state. If students who have been classified as residents of Texas are found to have been erroneously classified, those students will be reclassified as nonresidents and will be required to pay the difference between resident and nonresident fees for those semesters in which they were so classified. In addition, the students will be required to pay back all monies borrowed from the Texas Opportunity Plan Fund.

Reclassification as a Resident. If students have been erroneously classified as nonresident students and subsequently prove to the satisfaction of the appropriate officials of an institution of higher education that they should have been classified as resident students, they will be reclassified as residents of Texas and will be entitled to a refund of the difference between the resident and nonresident fees for the semesters in which they were so classified.

Penalties

Statute: Section 54.053 The governing board of each institution required by this Act to charge a nonresident tuition or registration fee is subject to the rules, regulations, and interpretations issued by the Coordinating Board, Texas College and University System, for the administration of the nonresident tuition provisions of this Act. The rules, regulations and interpretations promulgated by the Coordinating Board shall be furnished to the presidents or administrative heads of all Texas public senior and junior colleges and universities.

Section 54.061 The governing board of an institution of higher education may assess and collect from each nonresident student who fails to comply with the rules and regulations of the boards concerning nonresident fees a penalty not to exceed $10 a semester.

Student Compliance with Institutional Rules and Regulations. Each institution has been authorized by statute to assess and collect from nonresident students failing to comply with the provisions of the tuition statute and with these interpretations concerning nonresident fees a penalty not to exceed $10 a semester. In addition, if students have obtained residence classification by virtue of deliberate concealment of facts or misrepresentation of fact, they may be subject to appropriate disciplinary action in accordance with the rules and regulations that may be adopted by the governing boards of the respective institutions of higher education.

Student Financial Assistance. The objective of the student financial aid program at Texas Tech is to provide financial assistance to students who, without such aid, would not be able to pursue higher education. The financial assistance offered at Texas Tech is in various forms, including loans, scholarships, grants, and employment, and is awarded to students on the basis of financial need and other qualifications required by the donors of the funds. Need is defined as the difference between a reasonable expected expense to attend Texas Tech and the amount of money reasonably available to the student from all sources. No student or prospective student shall be excluded from participating in or be denied the benefits of any financial aid program at Texas Tech on the grounds of race, color, national origin, religion, or sex. Although qualifications required for each financial aid program may differ, the general requirements for financial assistance at Texas Tech are that the student must be enrolled for at least one-half the normal academic load, be in good academic standing with the University, and be in need of financial assistance.

The University participates in the following financial assistance programs:
National Direct Student Loan
Hinson-Hazlewood College Student Loan

Federally Insured Loans
College Work-Study Program
Supplemental Educational Opportunity Grants
Basic Educational Opportunity Grants
Texas Public Education Grants
Texas Public Education/State Student Incentive Grants
Student Part-time Employment

In addition to these federal and state supported programs, Texas Tech administers numerous private loan funds and scholarships.

Although no strict deadlines have been established for applications for most financial aid programs at Texas Tech, preference is given to applications received by April 15 for the fall semester, by October 15 for the spring semester, and by March 15 for the summer session. Applications received after these dates will be considered, but no guarantee can be given that the funds will be available when needed. Many scholarships have other deadlines which are listed in the *Scholarships and Financial Aid* publication.

Inquiries concerning student financial assistance should be sent to the Office of Student Financial Aid, Box 4179, Texas Tech University, Lubbock, Texas 79409. Information about the graduate fellowships, traineeships, and scholarships may be secured from the Graduate School.

Veterans' Exemptions From Fees Under the Hazlewood Act. Men and women who were legal residents of Texas at the time of entry into the Armed Forces, who have been legal residents of Texas for a period of not less than 12 months immediately preceding their registration in Texas Tech University, and who hold an honorable discharge from the Armed Forces of the United States after service during the Spanish American War, World War I, World War II, or the Korean War, are by state law exempt from the payment of all fees except library and laboratory fees or similar deposits and fees, or charges for room and board. These exemptions also apply to the children of members of the United States Armed Forces who were killed in action or died while in the service during World War II or the Korean War. Exemptions are also granted to all persons who were honorably discharged from the armed forces of the United States after serving on active military duty, excluding training, for more than 180 days during the Cold War which began on the date of the termination of the national emergency referred to as the Korean War. Exemptions are not granted to persons who were discharged from the services because of being over the age of 38 or because of a personal request on the part of such person to be discharged from such service.

Discharge papers must be presented by the student to the Registrar's Office, who will in turn certify the student's eligibility to the Office of Accounting and Finance.

Veterans are not eligible for the above outlined benefits under state law until their eligibility for educational benefits from federal funds through the Veterans Administration has expired.

General Fees.

1. *General Property Deposit:* Each student enrolled in the University must make a general property deposit of $10. This deposit is subject to charges

for property loss, damages, breakages, or violation of rules in the Library or laboratories.

Students are required to maintain a balance of $10 in their property deposit account. If the balance is below this amount they will be charged an additional fee sufficient to bring the account balance to $10. At their request these deposits, less charges, will be returned to them upon termination of their tenure here as students. Deposits will be held up to 90 days after the close of a semester, or after a student withdraws during a semester, so that all charges and fines may be accumulated from the various departments.

Under state law, deposits which remain without call for a refund for a period of four years from the date of last attendance will be forfeited and transferred to the Student Property Deposit Scholarship Account.

2. *Student Services Fee:* Each student is required to pay a Student Services fee based on the number of semester credit hours for which he or she is enrolled. The required fee and the services to which the student is then entitled are as follows:

Credit Hours Enrolled	Required Fee	For Services Of
		*Group I**
1	$ 5	Campus Transportation System
2	10	KTXT-FM
3	15	Student I.D. System
		University Daily
		Student Senate
		Spirit Groups
		Forensics
		Counseling Center
		*Group II***
4	20	Group I plus
5	25	Campus Organizations
6	30	Texas Tech Chorus
7	35	Texas Tech Symphony Orchestra
8	40	Student Health Service
		*Group III****
9	45	Groups I & II plus
10	50	Cultural Events
11	55	University Theatre
		Texas Tech Band
		Group IV
12 or more	60	Groups I, II, & III plus
		Women's Intercollegiate Athletics
		Recreational Services
		(Intramurals, Facilities,
		Pool, Sports Clubs)

*Students required to pay for Group I services may, at their option, elect to pay $40 for Group II services, $55 for Group III services, or $60 for Group IV services.

**Students required to pay for Group II services may, at their option, elect to pay $55 for Group III services, or $60 for Group IV services.

***Students required to pay for Group III services may, at their option, elect to pay $60 for Group IV services.

3. *Laboratory Fees:* A laboratory fee of $2 per semester is charged for all courses in which the combined lecture and laboratory credit is from 1 to 3 semester hours. For courses in which the semester credit is 4 semester hours or more the laboratory fee is $4 per semester.

4. *University Center Fee:* This is a $15 fee authorized by state law to be paid each semester of the long session by every student enrolled for 3 semester hours or more.

5. *Building Use Fee:* This is a fee authorized by state law to be paid each semester by every student enrolled in the University. The charge, each semester, is $6 per semester hour.

6. *Late Registration/Late Payment Fee:* Students who are permitted to register and/or pay during or after the first week of classes will be assessed a $15 late registration fee and an escalating late payment fee based on the payment date.

7. *Change in Class Schedule:* Any tuition and/or other fees chargeable as a result of class schedule changes will be made shortly after the 12th class day in the long semesters (or the 4th class day in the summer terms). Any tuition and/or other fees refundable as a result of class schedule changes will be made shortly after the 12th (or 4th) class day and in accordance with the following:

1st class day through 12th (or 4th) class day . . . . . 100 percent
After 12th (or 4th) class day . . . . . None

8. *Auditing Fee:* Students enrolled for 11 semester credit hours or less must pay a fee of $10 for the privilege of auditing a course.

Students enrolled for 12 semester credit hours or more who have obtained written permission from the dean may audit a course without paying an additional fee.

9. *Diploma Fee:* Graduating students will be charged a diploma fee of $8 for each degree granted. The fee will be refunded, provided graduation intentions are cancelled before the diploma has been printed and before other related steps are taken. If the student's intention to graduate is not cancelled in time, $2 will be charged for reordering the diploma insert. If both the insert and the cover have to be reordered, the charge will be $8, as in the initial order.

10. *Identification Packet Replacement Fee:* Students who lose their ID Packets may have them replaced by applying at the Registrar's Office. A fee of $2.50 will be charged any time during the semester for replacement of a lost ID Packet.

11. *Duplicate Certificate of Enrollment Fee:* A fee of 50 cents will be charged for each duplicate certificate of enrollment issued.

12. *Transcript Fee:* Copies of a student's transcript are available upon written request to the Registrar's Office. A copy of the transcript includes only the academic record accumulated at Texas Tech; copies of transcripts furnished from other institutions become the property of Texas Tech and will not be furnished by the University. The cost is $2 per copy, payable in advance. All transcript requests must be made by the student and must be in writing. Adequate advance notice, normally one week, is required for transcript processing.

13. *Motor Vehicle Fees:* A fee is required for all motor vehicles to be parked on the campus at any time. A schedule of these fees, together with other vehicle information, is contained in the publication *Traffic and Parking Regulations*, available at the Traffic and Parking Coordinator's Office.

Special Fees.

1. *Fees for Private Music Instruction:* The University tuition fees do not cover the following costs for individual instruction offered by the Department of Music in voice and in wind and string instruments. When instruction is given in one of the following courses in applied music, the charges listed are made for each course, payable in full at the time of registration:

Applied Music 1001, 1002, 2001, 2002, 3001, 3002, 5100, 5101 (1 semester hour credit) $15

Applied Music 1001, 1002, 2001, 2002, 3001, 3002, 4001, 4002, 5001 (2 to 4 semester hours credit) $30

2. *Fees for Binding Theses and Dissertations:* This fee is currently $6.30 per copy but is subject to change without notice. The fee for the microfilming of a doctoral dissertation is $35.

Refund of Fees. Any student officially withdrawing during a semester, either at the student's request or at the request of the University because of failure to comply with a condition upon which the enrollment was approved, will receive a refund of all tuition and mandatory fees in accordance with the following schedule:

Withdraws prior to the first class day	100 percent
During the first five class days	80 percent
During the second five class days	70 percent
During the third five class days	50 percent
During the fourth five class days	25 percent
After the fourth five class days	None

If a student drops a course or courses prior to the 12th class day of a fall or spring semester or 4th class day of a summer term and subsequently withdraws, the student is entitled to *only* a refund based upon the withdrawal schedule and not 100 percent of applicable tuition and fees.

If funds for payment of the withdrawing student's tuition and fees were furnished through the institution by a sponsor, donor, or scholarship, then the refund is made to the source rather than to the student.

When a student withdraws from the institution, student services and privileges such as health services, library privileges, facilities usage, and athletic and cultural entertainment tickets will be terminated.

No refunds will be made to a student suspended by University authorities. Full refund will be made when the University is at fault.

Residence Hall Policy. Many unique educational and social advantages are available to students who live on campus, and the University hopes that every student will have the opportunity to share the on-campus residential experience sometime during his or her undergraduate years.

The current University residence hall policy requires students having fewer than 32 hours of academic credit prior to the beginning of the fall semester to live on campus unless exempted by the Office of the Dean of Students. Specific types of exceptions to this policy are listed under "Residence Halls" in the Student Affairs section of this catalog. Requests for exceptions must be submitted to the Office of the Dean of Students before August 1 preceding the academic year. However, because of unforeseen changes in a student's circumstances due to illness or other personal reasons, some petitions are considered after August 1. Students are

encouraged to discuss such developments with the Office of the Dean of Students at any time.

Unless it is clearly established that illness or personal reasons which were not known prior to August 1 have arisen to necessitate a student's living off campus, students should not expect to be relieved of their academic-year residence hall obligations.

Residence Hall Reservations. Residence Halls, like all other services and facilities of Texas Tech, are available to all students regardless of race, color, religion, or national origin. Application for admission to the University and application for residence hall accommodations are separate transactions. Space in the University residence halls is reserved on a first-come, first-served basis. Roommate requests are granted when space is available if the request is mutual and if both applications are received at the same time. Other specific requests (i.e., building, type of room, etc.) will be granted when space is available. All students who apply for accommodations in the residence halls and are accepted sign an agreement for the full academic year.

A residence hall application will be mailed by the Admissions Office when a student applies for admission to the University. A duplicate application may be obtained from the Housing Office, Box 4629, Texas Tech University, Lubbock, Texas 79409.

Room and roommate assignments for new students will be made in June after the students in the residence halls have completed reassignments for the following year. Residents of the halls during the spring semester will have preference on space assignments.

There are several housekeeping apartments (Gaston Hall) available on campus for single women with 30 or more credit hours. Applications for these apartments are processed the same as for residence hall space.

Entering students who have paid the required deposit(s) should contact the Housing Office if cancellation becomes necessary. Information relating to cancellation is included with the housing application and is outlined in the residence hall agreement. A deposit refund, less $20, will be processed if cancellation notice is received in accordance with the established dates and procedures.

A $100 advance payment in addition to the $60 deposit is required to retain the room reservation for fall (spring). The $100 advance payment may be paid at the time the application is submitted or anytime prior to June 1. Cancellation dates and refund procedures are outlined in the Housing Application and Residence Hall Agreement.

All unclaimed rooms in the residence halls will be declared vacant at 8 a.m. on the first day of classes, and the deposits will be forfeited.

Students and parents are urged to read their residence hall agreements carefully.

Room and Board Charges. All students residing on campus must sign a residence hall agreement which is a contractural agreement representing the responsibilities of both the resident student and the University.

Rates for room and board in University residence halls are based on a per person charge. Students are encouraged to pay room and board by the semester; however, the charges may be paid by the academic year, by the semester, or by an

installment plan. If payment is to be made by installment, one-third of the semester charge is due at the time of occupancy.

The $100 advance payment required to retain the room reservation for fall (spring) will apply to the semester charge after occupancy. Statements of account are not sent to students or parents. A billing of the account is available to the student on the dates indicated for payment.

The 1983-84 academic year charges per student for a double room and 20 meals per week were as follows:

Doak, Gordon halls	$2,120
Bledsoe, Weeks, Wells, Horn, Knapp, Sneed, Carpenter halls	2,220
Wall, Gates, Hulen, Clement, Stangel, Murdough halls	2,467
Gaston hall	2,220-2,467
Chitwood, Weymouth, Coleman halls	2,565

The rates for 1984-85 will be established by the Board of Regents and mailed to students who have signed 1984-85 residence hall agreements or who have applied for on-campus housing.

Student Affairs

Bookstore. The Texas Tech Bookstore, a modern self-service facility owned and operated by the University, is conveniently located on the campus east of the Administration Building. The bookstore offers student customers one-stop shopping for all their school supplies and related items. Any profit generated by its operation is returned to the University.

Career Planning and Placement Service. This office provides a number of services to assist Texas Tech students and alumni in their career development.

Registration with the office, located on the third floor of West Hall, will give students, particularly seniors, the opportunity to meet the hundreds of employers who visit the campus each semester to conduct interviews. In addition, many other employers list specific vacancies within their organization or obtain names of students for potential employment. Graduate degree candidates are also encouraged to seek career counseling, use the career library, participate in job placement workshops, and maintain letters of recommendation for use by employers.

Underclass students may participate in career exploration programs, visit with counselors to discuss career goals, use the career library, and participate in Career Days. The office also has a summer employment program that covers a range of opportunities.

Cultural Opportunities. Students at Texas Tech have many opportunities to enhance their academic endeavors through co-curricular participation in a well-rounded program of cultural entertainment. Each year University Center Cultural Events, by recommendation of the Artists and Speakers Committee, brings the finest speakers, classical concerts, and dramatic, dance, and mime performances available to college and university campuses. Through the scheduling of residency activities during the visiting artists' and lecturers' stay on campus, students have the opportunity to work with the visiting guests and attend workshops and seminars which relate to their field of academic study.

Students wishing to become involved with the implementation of a Fine Arts series may wish to join the University Center Programs Fine Arts Committee. These student volunteers prepare programs in music, dance, mime, theatre, the visual arts, and literature. In addition to contracting performers and learning to work with theatrical agencies, members of the committee will be involved with promotion and production and have the chance to interact with the visiting artists.

Students with talent and ability in the performing arts have numerous opportunities for development through the Theatre Arts Department productions in the University Theatre, in the musical organizations sponsored by the Music Department, and in the University Dance Theatre, sponsored by the Department of Health, Physical Education, and Recreation. All eligible students, whether enrolled in these departments or not, are invited to participate.

In addition, within the city, Community Concerts and the Lubbock Symphony offer opportunities for students as either participants or spectators. Other cultural resources in the city include the Lubbock Theatre Center, Texas Tech Museum, and the Garden and Arts Center.

Dean of Students' Office. This office is concerned with the general welfare of students and their personal and interpersonal development. Programs coordinated by the Dean of Students' Office serve to enhance student development in the areas of leadership, decision making, responsible citizenship, human relations, group dynamics, personal growth, and co-curricular activities.

In addition to programs which foster student development, the Dean of Students' Office also provides special programs for selected segments of the student body who have unique needs requiring special skill development, counseling, and advising.

The Dean of Students' Office also administers the *Code of Student Affairs*, the New Student Orientation programs, student withdrawals, housing regulations, and student discipline.

Forensics and Dramatics. Students who meet general eligibility requirements may participate in intramural and intercollegiate debate, group discussions, extempore speaking, prose and poetry reading, and similar events. Both contest and noncontest events are held on campus and at other colleges. The Forensics Union and Delta Sigma Rho are active in sponsoring campus-wide speech activities.

Students may also participate in the plays presented by the Theatre Arts Department and in activities of its related organizations — Alpha Psi Omega and the U.S. Institute of Technical Theatre. Students may participate in acting, stage makeup, costuming, lighting, scene design and construction, publicity, and other activities connected with play production. Four major productions, numerous laboratory theatre productions, and a summer repertory season are presented each year.

Grievance Procedures. A number of opportunities are available to students for redress of grievances. In general, students wishing to review the action of a particular individual or department should direct their questions to the person responsible for the individual or department in the University organizational structure. Several procedures for handling specific problems have been established to expedite the filing and hearing of student concerns. Questions involving academic matters should be directed to the appropriate college office or to the Vice Presi-

dent for Academic Affairs. Questions concerning other grievance procedures may be directed to the Office of the Vice President for Student Affairs.

Intercollegiate Athletics. Texas Tech provides intercollegiate athletic programs for both women and men. Since its beginning in 1975, the Women's Athletic Department has grown rapidly and is now a Division I member of the Southwest Athletic Conference and the National Collegiate Athletic Association. Well qualified coaches, expanded facilities, and highly recruited athletes have made possible a respected and quality program. The department currently offers the following intercollegiate sports: volleyball, cross-country, basketball, golf, tennis, swimming and diving, track and field, and softball. The University's pride in the program is evidenced by the fact that Women's Athletics is now considered a viable part of the total athletic picture at Texas Tech.

The men's program includes football, basketball, cross-country, track, baseball, golf, swimming, and tennis. Texas Tech emphasizes academic excellence and within this framework offers a superior athletic program as an integral part of campus activities. The University holds membership in the National Collegiate Athletic Association and the Southwest Athletic Conference and conducts its program under the rules and regulations of these bodies. University policy is set by the Athletic Council composed of members from the faculty, the student body, the Ex-Students Association, and one member-at-large who is appointed by the President. The Department of Athletics is organized under the Director of Athletics with head coaches in each of the sports responsible to the director.

Minority Student Concerns. A variety of services, organizations, and activities on the campus are directed toward minority student interests and concerns. Questions regarding minority student programs and activities should be directed to the Dean of Students' Office, 250 West Hall.

Music Organizations. The University is represented by the following official touring musical organizations: Tech Choir, Symphonic Band, Marching Band, Jazz Ensemble, Music Theatre, and Symphony Orchestra. Students may also participate in the Tech Singers, Swing Choir, Court Jesters, Brass Band, Concert Bands, Chamber Orchestra, Jazz Bands and Combos, Brass Choir, Woodwind Ensemble, Guitar Ensemble, Viola Ensemble, Harp Ensemble, Flute Ensemble, Clarinet Ensemble, Oboe Ensemble, Saxophone Ensemble, Trumpet Ensemble, French Horn Ensemble, Trombone Ensemble, Tuba Ensemble, Percussion Ensemble, New Music Ensemble, and Piano Accompanying. Each organization is under the direction of a faculty member of the Department of Music and is open to any student who is officially enrolled in the University and meets academic requirements. Each group studies a broad repertoire and gives a number of public performances annually.

Office of International Programs. Texas Tech University recognizes the unique cultural adjustment problems which face students from abroad. The University further recognizes that a full and meaningful education and the solution to adjustment problems for international students will depend in part on their understanding of American culture through contacts with American students and the American community and family.

The staff of International Programs is responsible for all nonacademic advisement of international students. The staff also provides personal counseling and

advice on immigration regulations as well as coordinates extracurricular programs through the Lubbock Council for International Programs and the Presidents' Council to the director of the Office of International Programs.

In addition, the Office of International Programs can provide information on overseas study programs for American students.

Participation in Extracurricular Activities. A broad program of extracurricular activities at Texas Tech offers students opportunities for fellowship, leadership, recreation, and cooperative interaction with members of the faculty and each other. Students may participate in clubs and societies, publications, sports, music, drama, forensics, and other activities according to their interests and abilities.

Any student not on disciplinary probation which restricts eligibility may become a candidate for, or hold an office in, a recognized student organization or represent the University in any extracurricular activity unless the organization has placed additional eligibility requirements for membership in its bylaws or constitution.

Graduate students may also participate in extracurricular activities and are encouraged to affiliate with honor societies for which they are qualified. Graduate students who are satisfactorily pursuing programs of graduate work are eligible to serve as officers in all student organizations.

There are no eligibility requirements for participation in student organization sponsored off-campus trips and activities. Each student participating in an off-campus activity of any type does so on a voluntary basis. Parents and students should understand that students are responsible for their own safety and welfare while participating in an off-campus activity and that such participation is at the student's own risk. Texas Tech University assumes no responsibility for students participating in off-campus activities. Students are responsible for making their own individual arrangements with instructors for class work missed while participating in an off-campus activity.

Eligibility rules for the Southwest Conference are administered by the Texas Tech Athletic Council. Additional information on student organizations and activities may be obtained from the Dean of Students' Office and the Student Activities Office in the University Center.

Residence Halls. The Texas Tech residence hall system includes both air-conditioned and non-air-conditioned buildings. All student rooms are adequately furnished, including direct telephone lines to each room and mail service to each hall. Storage rooms, color TV, lounges, quiet study areas, and public lounges are provided, as are laundry rooms with automatic coin-operated washers and dryers.

Each residence hall is organized into a student association which assists in governing the hall and sponsors such activities as dances, mixers, movies, recognition dinners, open houses, and tutoring services.

The University maintains 19 residence halls that house approximately 7,300 students. The University requires that eligible students live in the University residence halls if there are vacancies. Students who cannot be accommodated in a residence hall at the time of registration and who are not excepted are required to move into a residence hall upon notification by the University. The University feels that its students will have their best opportunity for a well-rounded educational experience while living in a supervised residence hall designed for student living.

The University considers that the housing regulations apply when a student is registered for two or more courses. Any student registered for credit may live in the residence halls if space is available. Priority is given to those enrolled for a full-time academic schedule.

Requests for exceptions to the housing policies must be submitted to the Office of the Dean of Students before August 1 preceding the school year.

Subject to verification and authorization by the Office of the Dean of Students, students will be given permission to live off campus provided:

1. A student is living and continues to live in the established household of his or her parents.
2. A student presents evidence of financial hardship conditions and is living in the established household of a brother, sister, grandparents, uncle, or aunt. In the event the individual with whom the student lives changes residence, the student shall promptly notify the Office of the Dean of Students.
3. A student is married.
4. A student is 21 years of age or over on or before the first day of classes for the fall semester.
5. A student has successfully completed 32 or more semester hours of academic credit before the beginning of the fall semester or has lived in University residence halls for two regular semesters.
6. A student is enrolled in the Graduate or Law schools.
7. A student has served in the military service as verified by a discharge certificate (DD214).
8. A student has a health problem as verified by the Student Health Service which precludes living in the residence halls.
9. A student presents evidence of extreme hardship which will be intensified by living in the residence halls.

Any *one* of the nine exemption categories will be sufficient.

It is recognized that changes in a student's circumstance may arise because of illness and/or personal reasons and that a few petitions will therefore need to be considered after August 1. The Office of the Dean of Students will be pleased to discuss such developments with the student at any time.

Evidence of deliberate falsification of information, data or of any materials submitted or providing of false or erroneous information in connection with application for off-campus housing verification shall be grounds for taking disciplinary action against the student in accordance with the *Code of Student Affairs.* Any student wishing to move from the residence halls is required to file a request for a contract release, which will be reviewed for its merits by the Housing Contract Release Committee. It is the responsibility of the student to file a change of address form or correct any incorrect information regarding housing in the Office of Admissions and Records. Failure to do so will be considered cause for disciplinary action. *Authorization for off-campus housing does not relieve the student of contractual obligations which may have been assumed with the University for housing in the residence halls.*

Residence Hall Dining. Students who live in the residence halls eat their meals in one of the eight dining rooms located near or in the residential buildings. Twenty meals are served each week; the evening meal on Sunday is not provided,

nor are meals served during the Thanksgiving, Christmas, or Spring vacation periods. The semester cost to students for meals is reasonable for the number of meals available. Students miss many meals and this experience is considered when board and room rates are established.

Meals are usually served cafeteria-style with choices available. Seconds on all but the more expensive desserts and entrees are available when desired.

Because of the large numbers accommodated, special diets are not offered in each dining room. When recommended by the Student Health Clinic, a diet plan may be available to the student in one of the dining facilities.

Residence Halls Management and Governance. Each residence hall is managed by an experienced and trained staff of hall directors and resident assistants. These hall directors are selected on the basis of professional training, experience, and an interest in working with young people.

The interests of all students living on campus are promoted through the Residence Halls Association, a student government organization. In addition, each residence hall has its own hall organization which sponsors cultural, social, and recreational programs for residents.

Student Accident and Sickness Insurance Plan. All students attending Texas Tech on a full-time basis (according to University definition) may subscribe to a supplemental Student Accident and Sickness Insurance plan which provides 24-hour coverage on or off campus while in any hospital or under the care of any qualified physician (according to the policy provisions). The 12-month plan covers all vacations and remains in force even though the student graduates or drops out of school. The policy is effective on August 25 (or date applied for, if later) and terminates on August 25 of the following year. Married students may include their spouses and children for an additional premium. New spring students may enroll at a prorated premium with coverage terminating on August 25. Complete information on the insurance program is mailed to each new student. Further details and claim forms are available in the Student Association Office in the University Center.

Student Conduct. Responsible citizenship among college students includes honesty and integrity in class work, regard for the rights of others, respect for local, state, and national laws and for campus regulations. Specific regulations concerning the rights and responsibilities of students at Texas Tech are contained in the *Code of Student Affairs* and students are expected to become thoroughly familiar with and abide by these regulations. Copies of the *Code* may be obtained from the Dean of Students' Office.

Student Government. By enrolling in the University, all students automatically become members of the Student Association. The Student Association serves as a liaison between the students and the administration, city, and state governments. The SA provides many services for the students including the Book Exchange, a guide to housing in Lubbock, the *WORD*, and sponsors theatre ticket discount coupons.

The Student Senate plans, publicizes, and supervises student elections. It supports student enterprises and organizations through funds it receives from student service fees and plays a leading role in the administration of student affairs for the Student Association. It also recommends student representatives for University committees.

Student Health Service. The Texas Tech University School of Medicine operates the Student Health Service for all Texas Tech students including the School of Medicine.

The Student Health Service provides those personal health services expected of a family physician's office including preventive, diagnostic, therapeutic, and rehabilitative care for both physical and emotional problems. The service's personnel are also available for participation in conferences, roundtables, and classes in support of the community health needs of the campus.

The Student Health Service is located in Thompson Hall and provides a walk-in type ambulatory clinic. Physicians and health care personnel operate the clinic from 8 a.m. until 6 p.m. daily, Monday through Friday. Treatment is confined to the clinic. Physicians do not make dormitory or house calls.

Emergency medical care is available at the Emergency Room of Lubbock General Hospital (or hospital of the student's choice) from 6 p.m. until 8 a.m., Monday through Friday, and 24 hours per day on Saturday, Sunday, and clinic holidays. The first $25 of the above emergency medical care is covered by the Student Health Service. To obtain this refund, the student should make arrangements to pay for all emergency services and then present proof of payment to the Student Health Service.

Pharmacy, laboratory, and x-ray services are available between the hours of 8 a.m. and 5 p.m. Many routine procedures are provided under student health coverage, and the full resources of the Medical School's Clinical Teaching Facility can be used on referral when needed.

Conditions requiring the services of medical specialists will be referred to the appropriate department of the Medical School; if a particular specialty is not represented on the Clinical Faculty of the Medical School, the student will be referred to a qualified physician in the community. Referrals outside the Student Health Service — either to specialists within the Medical School or to those in the community — are not covered by student fees, and the student must assume all financial obligations for such referrals.

In-patient medical care is not provided by the Student Health Service. Where hospitalization is required, the Lubbock General Hospital will be used unless the student or physician expresses another preference.

Students are urged to pay particular attention to the Student Health Brochure issued at the time of enrollment. The brochure lists, for the particular year, those medical services available without charge.

The Student Health Service encourages communication from the family physician of students who require continuing medical support and will endeavor to carry on the physician's programs of care for the students as their "family doctor, away from home." Where pertinent medical information is required, the Health Service may communicate directly with the student's family doctor. Parents may be contacted when serious illness or emergencies so indicate.

Student Legal Counsel. A program designed to bring legal advice and guidance within the reach of students was inaugurated at Texas Tech in 1973. The office is staffed by a licensed attorney who is assisted by law students serving in the capacity of clinical assistants. The legal office is located on the third floor of West Hall; students are welcome on a walk-in or appointment basis.

The primary objectives of the program are to afford the students confidential legal advice on individual problems and to establish an educational office designed to inform the students of their obligations and duties as well as their rights as defined by a system of law. Informal lectures on legal topics of concern to students are conducted on request.

The Student Legal Counselor is unable to actually represent students in court; however, most cases are resolved through negotiation, advice, and proper direction. The office is dedicated to the concept of preventive law.

Student Organizations. The University registers over 300 student organizations, giving them the opportunity to schedule events and to use University facilities designated for use by student organizations. A complete descriptive list of registered student organizations is published annually by the Student Activities Office.

The University also recognizes 24 national social fraternities and 14 national social sororities. The fraternities are governed by the Interfraternity Council and the sororities, by the Panhellenic Council. Most of the Greek letter social organizations own and operate their own meeting lodges in the immediate vicinity of the Texas Tech campus. The Dean of Students' Office coordinates the activities of the Greek system at Texas Tech and can provide additional information to students interested in joining a fraternity or a sorority.

Student Part-time Employment. To assist worthwhile students who must, or wish to, finance themselves while in school and who are either not eligible for or do not choose to participate in one of the other financial aid programs, the Student Financial Aid Office administers a Student Part-time Employment service. A current listing of employment opportunities both on and off campus to which students may be referred is maintained. Since employers usually desire to have personal interviews before selecting an employee, it is preferable for students seeking employment through this service to wait until they come to the campus to check on openings. See also the section entitled "Student Financial Assistance."

Student Personal Property Insurance Plan. All Texas Tech students are eligible to purchase optional personal property and bicycle insurance under a program sponsored by the Student Association. This insurance has very reasonable premium rates for broad coverage for theft of personal property and is available to all students. Complete information and applications are distributed during the normal registration periods and are also available in the Student Association Office in the University Center.

Student Publications. The *University Daily,* the University newspaper, is published daily, Monday through Friday. *La Ventana* is the University yearbook, published annually. Both of these publications are staffed with personnel from the student body. The Student Publications Committee, a faculty-student committee, recommends the selection of editors and the annual budgets for both publications.

Student Recreation Center. Especially attractive is the new $5.5 million Student Recreation Center. It is located on the west side of the campus adjacent to the Recreational Aquatic Center and has 126,000 square feet of recreation space. Included in the building are 12 handball/racquetball courts; a squash court; 3 multipurpose rooms that house the martial arts, wrestling, tumbling, fencing, indoor archery, golf, and dance; a 280′ by 115′ gymnasium with 5 basketball

courts or 5 tennis courts, or 6 volleyball courts, or 12 badminton courts, or any combination of the above; 2 weight areas; a punching bag room; 2 locker rooms with saunas; an outdoor shop; a recreational workshop; a media library; a classroom; offices; and a lounge.

Testing and Evaluation Division. The Testing and Evaluation Division, located in Room 213, West Hall, is responsible for coordinating and administering standardized testing programs in four major areas: (1) Admission Testing Programs for the University including Graduate Record Examinations (GRE), Graduate Management Admissions Test (GMAT), Medical College Aptitude Test (MCAT), Dental Admission Test (DAT), Pharmacy College Aptitude Test (PCAT), Scholastic Aptitude Test (SAT), and the American College Testing Program (ACT), among others; (2) Texas Tech University Credit-by-Examination testing including the College Level Examination Program (CLEP) and the College Entrance Examination Board (CEEB) Achievement tests in specific subject areas; (3) standardized testing at the request of various departments such as the English Proficiency Test, Graduate School Foreign Language Test (GSFLT), Miller Analogies Test (MAT), and National Teachers Examination (NTE), among others; and (4) special testing services and consultative services for University groups upon request and on a time-available basis.

The division also offers academic evaluation services in six areas on an at-cost and time-available basis. These six areas are evaluation of an individual's (1) academic strengths including analysis of past academic performance, (2) learning skills in the areas of relative academic speed under stress, (3) vocational interest patterns including job interests, (4) career interest patterns for short term and long term career plans, (5) learning disabilities, and (6) special interests and special aptitudes.

University Center. The University Center is one of the few buildings on campus specifically constructed for the out-of-class activities of the campus community. The building features an outstanding 1,000-seat theater, a large covered courtyard, and numerous services and facilities for the use and convenience of its patrons. The recent total renovation of the UC cafeteria has provided an efficient and very pleasant facility for serving drinks, snacks, and full meals.

The University Center also offers twelve meeting rooms including two ballrooms, which may be used by any registered campus organization or department for little or no charge. The Games Room offers pool, snooker, billiards, table tennis, several coin-operated games, and a professional dart board. In addition to the games area, more than 70 electronic games to test a player's skill are located in the "Lower East Side."

Food service in the UC is divided into several separate areas to serve the students, faculty, and guests on the campus. The 500-seat snack bar offers breakfast, hot and cold drinks, sandwiches, and a la carte orders until the building closes each night. The 280-seat cafeteria provides a variety of foods at reasonable prices during the lunch period and assorted drinks and snacks from 8 a.m. until 2 p.m., Monday through Friday. The Faculty Club offers hot and cold drinks and snack items from 8 a.m. until 4 p.m. daily and provides a cafeteria-style lunch Monday through Friday to club members and their guests. The UC also provides a catering service for campus organizations and groups and is prepared to serve from 5 to 800 in one or more of the special dining areas in the building. Arrangements can

be made at the catering office for buffets, banquets, luncheons, teas, coffees, and picnic orders. Another service provided by the University Center is the Eis Haus ice cream bar located in the Courtview Snackbar. The Eis Haus provides a complete selection of ice cream treats including over 31 flavors.

Besides providing many facilities for student and faculty use, the University Center has a multifaceted activities area that provides programs for the Texas Tech and Lubbock communities, skill development opportunities for individual students, services for campus organizations, and coordination of major campus events. University Center Activities is located on the second floor of the center and houses UC Cultural Events, UC Programs, Student Organization Services, and the UC Ticket Booth.

The goal of UC Cultural Events is to provide Texas Tech with the highest quality of distinguished speakers and performing artists. These programs are selected by the University Artists and Speakers Committee which is composed of faculty, staff, and students. The programs are implemented by a professional activities staff. The money to finance the Cultural Events programs comes from student service fees, grants, and income generated from the programs.

The goal of UC Programs is two-fold: while providing the Texas Tech community with entertaining and educational activities, the 150 volunteer students working in UC Programs actually receive an invaluable out-of-class experience, by selecting and implementing those very activities. A professional activities staff serves as advisors to the nine committees of UC Programs, which are: Almost Weekly, Concerts, Cultural Exchange, Films, Fine Arts, Ideas and Issues, Recreation, Travel, and Video.

Student Organization Services is a newly formed branch of the University Center Activities Office designed to meet the needs of over 300 Texas Tech student organizations. This is accomplished through leadership/skill workshops and event advisement for campus groups. In the planning stages are such services as the *Student Organization Handbook*, copying services for organizational business, graphics assistance, and a Ready Reference resource library.

The UC Ticket Booth serves as the major outlet for advance ticket sales for all of the Cultural Events and Programs functions. The service is also provided free of charge to any registered student organization. It is open from 8:30 a.m. to 4:30 p.m., Monday through Friday.

Hours of operation of the University Center are 7 a.m. to 10:30 p.m., weekdays, 7 a.m. to 11:30 p.m., Friday, 8 a.m. to 11:30 p.m., Saturday, and 2 to 10:30 p.m., Sunday.

University Counseling Center. The Counseling Center provides Texas Tech students with assistance concerning personal, academic-educational, and vocational matters. It also provides group experiences in the form of encounter groups and marital and premarital counseling groups. It provides consultation services to faculty and staff on campus. It is involved with academic development in the form of a Reading Improvement Program and a Program for Academic Support Services (P.A.S.S.) The Counseling Center is available to any enrolled Texas Tech student and all information and services are strictly confidential. The main office is Room 214 West Hall. Office hours are 8 a.m. until 5 p.m., Monday through Friday.

Academic Information

Academic Regulations

Classification of Students. A student will normally complete one-fourth of the work required for a degree each year; hence, the traditional classifications designate the progress made toward a degree: freshman (a beginning student who has not completed 32 semester hours); sophomore (32 to 63 semester hours); junior (64 to 95 hours); senior (96 hours or more with a minimum grade-point average of 2.00). The two ranks, junior and senior, are often referred to as "upperclass" and "advanced." A student who is enrolled for 12 or more credit hours per semester is considered a full-time student; one enrolled for fewer than 12 hours is considered a part-time student.

A student is considered to be making satisfactory progress toward a degree objective when he or she completes at least 12 credit hours in each semester, achieves a grade-point average of 2.00 or higher in each semester, and maintains an overall grade-point average of 2.00 or higher.

Semester Hours and Course Loads. The semester hour is the unit of measure for credit purposes. The student is expected to spend approximately two hours in preparation for each hour of lecture or recitation.

The number of semester hours a student may carry (course load) is regulated by the academic dean. In determining this load the dean takes into account the quality of scholastic work performed by the student, the types of courses involved, the student's health, and extracurricular interests and activities.

Enrollment in One of the Colleges or Schools. Each student accepted for admission will enroll in one of the six colleges or two schools of the University: Agricultural Sciences, Arts and Sciences, Business Administration, Education, Engineering, Home Economics, Law, or Graduate. The student should consult the dean of the college or school whenever any question arises concerning academic status. Matters specifically requiring the academic dean's approval include:

Course load and schedule
Changes in schedule, including dropping and adding courses
Withdrawal and honorable dismissal from the University
Graduation requirements and candidacy for a degree.

Dropping a Course. Students may officially drop a course in which they are enrolled only through the 30th class day of a long semester or the 12th class day of a summer term. Students dropping a course within those time periods will receive the grade of W regardless of their progress in the class. If a dean drops a student from a course after the 30th class day (12th for summer) for failure to attend classes, the grade of WF will be given. Students cannot officially drop courses after these established deadlines without withdrawing from the University.

Change of College. Students who wish to transfer from one college of the University to another should contact the academic dean of the college to which they plan to transfer to make sure that they can meet all enrollment requirements. Then they complete an Academic Transfer form in the Registrar's Office. A copy of this transfer is sent to both academic deans concerned. A student may complete this Academic Transfer at the beginning of each semester, after receiving registration materials for a particular semester but before registering for that semester.

Change of Address. Each student is responsible for maintaining his or her correct address on file in the Office of Admissions and Records. Change of address forms are available in that office, and other campus departments will be notified when such a form is filed. Students required by the housing residence rules to live on campus may not move off campus during the semester without approval of the Office of the Dean of Students.

Class Attendance. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is expected, and the University reserves the right to deal at any time with individual cases of nonattendance.

The effect of absences on grades is determined by the instructor, and when absences jeopardize a student's standing in a class, it is the responsibility of the instructor to report that fact to the student's dean. Excessive absences constitute cause for dropping a student from class; in such a case the grade of WF will be given. Should such an action reduce the student's course load to less than 12 semester hours, all extracurricular privileges will be lost. In extreme cases the academic dean may suspend the student from the University.

Department chairpersons, directors, or others responsible for a student representing the University on officially approved trips should notify the student's instructors of the departure and return schedules. The instructor so notified should not penalize the student, although the student is responsible for material missed.

In case of an illness that will require absence from class for more than one week, the student should notify his or her academic dean. The dean's office will inform the student's instructors through the departmental office. In case of class absences because of a brief illness, the student should inform the instructor directly.

Academic Integrity. It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work which they have not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension.

1. *Cheating:* Dishonesty of any kind on examinations and quizzes or on written assignments, illegal possession of examinations, the use of unauthorized notes during an examination or quiz, obtaining information during an examination from the examination paper or otherwise from another student, assisting others to cheat, alteration of grade records, illegal entry or unauthorized presence in an office are instances of cheating.

Complete honesty is required of students in the presentation of any and all phases of course work as their own. This applies to quizzes of whatever length as well as to final examinations, to daily reports, and to term papers.

2. *Plagiarism:* Offering the work of another as one's own, without proper acknowledgement, is plagiarism; therefore, any student who fails to give credit for quotations or essentially identical expression of material taken from books, encyclopedias, magazines, and other reference works, or from the themes, reports, or other writings of a fellow student, is guilty of plagiarism.

Grading Practices. A grade is assigned for all courses in which a student is regularly enrolled during any semester or summer term. Only through regular

enrollment can a grade be earned. A passing grade may be earned only if the student is enrolled for the duration of the course, and a grade, once given, may not be changed without the approval of the student's dean.

The grades used, with their interpretations, are A, excellent; B, good; C, average; D, inferior (passing, but not necessarily satisfying degree requirements); F, failure; P, passing; PR, in progress; I, incomplete; W, withdrawal; WF, withdrawal failing. The letter R designates a course repeated to remove an I.

The grade of PR is given only when the work in a course extends beyond the semester or term; it implies satisfactory performance and is used primarily in thesis and dissertation courses.

The grades of CR, credit, and NC, no credit, are given only in the College of Education for student teaching.

The grade of I is given only when a student's work is satisfactory in quality but, due to reasons beyond his or her control, has not been completed. It is not given in lieu of an F. The instructor assigning the grade will stipulate, in writing, at the time the grade is given the conditions under which the I may be removed. The I will be replaced with an F after it has remained on record for a year without completion. The I may be replaced by an R if the course is repeated. The appropriate grade will be given for the second registration.

The grade of W is given for a course officially dropped during the first six weeks of a term. A student should continue to attend a class until authorized by the academic dean to drop a course.

After the first six weeks of a semester, the grade of WF is given when the student is required by the dean to drop the course for failure to attend the class.

An X is shown on the grade report in those instances where, for any reason, a grade is not reported by the faculty. The designation X is not used in determining grade-point averages.

Grade Appeals. Students who wish to appeal a course grade should contact their academic dean's office. Copies of the grade appeals policy, procedures, and forms are available in each dean's office.

Semester Grade Reports. At the close of each semester and each summer term, final course grades are mailed to all students at their permanent home addresses. A copy is also available in the Registrar's Office. Changes in the mailing address for grade reports must be filed on the proper form provided in the Registrar's Office.

Grade Points. The grades of A, B, C, and D carry with them grade points of 4, 3, 2, and 1, respectively, for each semester hour of credit value of the course in which the grade is received. All other grades have no grade points assigned them.

Grade-Point Averages. The grade-point average for a semester is determined by dividing the total number of grade points acquired during that semester by the total number of semester hours of all courses in which the student was registered in that semester, exclusive of courses in which a grade of W is received. In the same manner, the overall grade-point average is obtained by dividing the total number of grade points earned in all courses for which the student has registered at this University, including hours of F and WF. Repeated registrations are counted in the total.

A student may repeat courses for credit with the prior approval of the academic dean. When a course is repeated, only the grade made in the last registra-

tion is used in calculating the grade-point average for meeting graduation requirements unless otherwise stated for a particular college. See individual college sections of the catalog for specific requirements.

With the approval of the student's dean, a grade-point deficiency in degree requirements may be made up by earning sufficient grade points in additional courses.

Only courses taken and grades received at this University are used in calculating grade-point averages.

Pass-Fail Option. Undergraduate students may take up to 13 semester hours toward satisfying degree requirements in which they will be graded on a pass-fail basis. Courses specified in the catalog as available only with pass-fail grading and courses taken in excess of degree requirements are not included in the 13-hour restriction.

No more than 9 hours of course work used to satisfy general degree requirements may be taken pass-fail. A student may be restricted by his or her college or department from taking a course pass-fail which is a prerequisite for a course or courses in his or her major field.

No student on probation will be allowed the pass-fail option.

A student must declare the intent to take a course pass-fail no later than the last day on which a grade of W is automatically given for courses dropped. A student who has chosen to take a course pass-fail may not subsequently change to a letter graded basis.

The names of students taking a course pass-fail will not be made known to the instructor.

Courses taken in the declared major or minor shall not be taken by pass-fail unless required by the department. The department of the major or minor will decide whether courses taken under the pass-fail system, before a student has declared a major or minor, shall count toward satisfying the degree requirements.

Credit by Examination for Matriculated Students. With the approval of their academic dean, matriculated students in the University may attempt examinations on courses in which they think they have acquired the basic knowledge. Certain CEEB nationally standardized tests and departmental examinations are available for matriculated students to attempt credit by examination in undergraduate courses (see section entitled "Undergraduate Credit by Examination").

Honor Lists. Full-time undergraduate students who earn a grade-point average of 4.0 during a semester are eligible for the President's Honor List. Those who earn a grade-point average of 3.50 or higher during a semester are eligible for the Dean's Honor List of the college in which they are enrolled during that semester. For these lists, students must be enrolled for at least 12 hours excluding any courses graded pass-fail.

Graduation With Honors. Members of a graduating class who complete their work with a grade-point average of 3.9 or above are graduated *Summa Cum Laude,* those who complete their work with a grade-point average of 3.7 to 3.89 are graduated *Magna Cum Laude,* and those who complete their work with a grade-point average of 3.5 to 3.69 are graduated *Cum Laude.* Appropriate designation of the honor is made on the diploma and on the commencement program. No person is considered for graduation honors unless at least one-half of the

degree credit has been completed at this institution, and the half must include the senior year. Only grades earned at Texas Tech are counted.

Honors Studies. Honors courses, formerly limited to Arts and Sciences, are now available in several colleges. Interested students should consult the Honors Studies Coordinator for their college. Also see the section entitled "Honors Studies" in the College of Arts and Sciences.

Academic Status. There are four categories pertaining to academic status for undergraduates. Students may continue enrollment according to regulations described below.

Good Standing. Students who maintain cumulative and current semester grade-point averages (GPAs) of 2.00 or above are considered to be in good academic standing at Texas Tech. In addition, some academic programs have requirements over and above the cumulative GPA of 2.00 that must be met to remain in good standing within those specific programs.

Academic Warning. Students whose cumulative GPA at Texas Tech falls below 2.00 will enter the subsequent semester of enrollment under a status of "Academic Warning" and will remain there until the cumulative GPA is brought up to 2.00 or above. In such status students must seek regularly scheduled advice and counsel from their academic advisor or dean. Academic Warning is designed to alert students that they will not meet their graduation requirements as noted below if their cumulative GPA remains below 2.00. Entering freshmen who begin in the summer will not be subject to Academic Warning until after their first regular (fall or spring) semester.

Scholastic Probation. Students under Academic Warning (or who have previously been in such a status) whose current semester GPA (not including summer terms) falls below 2.00 will enter the subsequent semester on "Scholastic Probation." Such students may not enroll for more than 15 hours without prior approval of their academic dean. In addition, these students must continue to seek regularly scheduled advice and counsel from their academic advisor or dean. Students on Scholastic Probation whose current semester (not including summer terms) GPA is 2.00 or above will be taken off probation.

Scholastic Suspension. Students on Scholastic Probation whose current semester (not including summer terms) and cumulative GPAs fall below 2.00 will be suspended for the next regular semester or full summer.

Students on Scholastic Suspension may seek reinstatement after a minimum of one semester (two summer terms count as one semester). Students who have received more than one suspension may seek reinstatement after two semesters. Reinstatement granted after suspension will be probationary. Students who apply for readmission following suspension will be required to undergo such testing and counseling as the academic dean considers necessary. Applications for readmission should be received in the Office of Admissions at least 60 days before the beginning of the anticipated term of enrollment.

Graduation Requirements. Graduation requirements include a minimum cumulative GPA of 2.00 for all courses, including repeated courses, attempted in the degree program in which students seek graduation.

Withdrawal from the University. Students who find it necessary to withdraw from the University before the end of a semester or summer term must apply to the dean of the college in which they are enrolled no later than ten class days

before the first day of the final examination period. Students under 18 years of age should first consult their parents and should secure from them a written statement showing that they have their permission to withdraw. The grades of W or WF are recorded in keeping with the regulations set forth in the section on Grading Practices and are based on the student's standings on the last day of enrollment in each course in which he or she is registered.

A student who withdraws from a residence course with a grade of W may complete the course through the Division of Continuing Education by registering for correspondence work, provided the course is regularly offered through correspondence and provided the instructor who taught the residence course is assigned as the correspondence instructor. Credit received through the process just described is recorded as correspondence credit.

Foreign students must receive clearance from the Director of International Programs as a part of the withdrawal procedure.

Teacher Education

The preparation of new teachers and the improvement of teachers already in service is an important function of the University at both the undergraduate and the graduate levels. The coordination of the total teacher education program is a responsibility of the Dean of the College of Education who serves as Director of Teacher Education and Certification.

General advice on specific degree requirements is available in the office of the academic dean of the college in which the student is enrolled. The student may be advised on certification requirements in the office of the Associate Dean for Programs of the College of Education or by an appropriate faculty advisor in the College of Education. Selection of courses in the student's teaching field or area of specialization is determined by an advisor in the academic department involved.

Teacher Certificates. The 67th Legislature passed Senate Bill 50 in 1981 prescribing new classes of certificates and different time periods for which the certificates are valid. The changes have been implemented by the State Board of Education effective in May 1986. Contact the Office of the Dean of the College of Education about the current status of levels and duration of teaching certificates.

Teacher certification and degree programs are two distinct programs. A student may qualify for teacher certification by majoring in education or by majoring in one of the fields of academic specialization and fulfilling all certification requirements. Policies governing certification programs are administered by the Director of Teacher Education and Certification, through the Office of Teacher Certification.

Admission to the Teacher Education Program. The student expecting to enter a program leading to teacher certification must apply for admission to the teacher education program through the office of the Associate Dean for Programs of the College of Education during the sophomore year or, if he or she is a transfer student, during the first semester of attendance at Texas Tech. Failure to qualify for admission to the teacher education program by the close of the sophomore year may result in a delay in the completion of the certification requirements within the usual four-year period.

A student applying to the teacher education program must have a certification plan on file in the College of Education.

The following are prerequisites for admission to the teacher education program:

(1) A minimum of 60 semester hours with a scholastic grade-point average of 2.5 or higher on all work passed prior to admission.
(2) 12 semester hours of English courses with a minimum grade-point average of 2.25. The minimum grade-point average can be waived by demonstrated proficiency at the fiftieth percentile or above on an English proficiency test administered by the University.
(3) A satisfactory level of performance on a competency examination of basic skills. (Required of all persons admitted to the teacher education program after May 1, 1984.)
(4) Good character and high ethical standards. (All applicants for Texas certification are screened for a record of felony or misdemeanor convictions through the Texas Department of Public Safety. All potential certificate applicants with criminal felony or misdemeanor convictions should immediately contact the Texas Tech Certification Office to seek clarification of their certification status.)

Certification Plan. Any undergraduate student working toward a teacher's certificate should file a certification plan in the College of Education *during the last half of the sophomore year* or during the first semester of attendance at Texas Tech, except that students in agricultural education or home economics education must consult their department chairperson regarding the proper time to file this certification plan. The student's advisors will assist in filing the certification plan. Any graduate student working toward a professional certificate should file a certification plan in the College of Education following admission to the professional certification program. The requirement for filing a certification plan applies regardless of the degree being sought, the subject which the student expects to teach, or the level (early childhood, elementary, secondary, special education, or all-level) at which he or she expects to be certified. Transfer students must prepare a certification plan during their first semester of attendance at Texas Tech. Degree plans and certification plans are not to be confused because they may be two separate documents. The degree plan is to be filed in the office of the student's academic dean, whereas the certification plan must be filed in the College of Education.

Certification plan forms are obtained from the College of Education. Once the form is secured, the student is responsible for seeing that the proper entries are made and that the forms are properly filed.

Admission to Student Teaching. The completion of 6 semester hours in student teaching is required of every person who obtains a teacher's certificate. Normally a student will take the student teaching course in a single semester during the senior year. Since the teaching experience requires a major portion of the student's time during the entire semester, the student teacher is permitted to enroll for no more than 16 semester hours of college work, including student teaching and correspondence courses, while performing student teaching.

The following are prerequisites to admission to student teaching:

(1) The applicant must have completed a minimum of 90 semester hours of college work. A student seeking admission to student teaching in sec-

ondary schools must have completed a minimum of 15 semester hours required in each of the teaching fields or 30 hours in a composite field and 9 semester hours in professional education courses; the foregoing must include EDSE 3300, 3321, and EPSY 3330 or their approved equivalents. For those seeking admission to student teaching in the elementary grades, the 90 hours must include (a) 24 of the 36 semester hours in the academic specialization area, and (b) the completion of any four three-hour professional education courses. Students seeking kindergarten endorsement with elementary certification should have completed 6 hours of the required early childhood course work (ECEL 3310, 4310, C D 3300) prior to student teaching in addition to the elementary requirements. For those seeking to student teach to fulfill requirements for the teachers of young children certificate, the 90 hours must include (a) 24 of the 37 semester hours in the academic specialization area, and (b) 12 hours of professional education including ECEL 3310 and 4350. The prospective all-level student teacher must have completed 60 percent of the course work in the specialization area, ECEL 3320, EDSE 3321, and EPSY 3330.

(2) Each student, unless enrolled in agricultural education or home economics education, must file an application for student teaching in the Office of Student Teaching. To enroll in fall student teaching, applications must be received on or before the preceding December 1. For enrollment in the spring semester, applications must be received on or before the preceding July 15. Students in agricultural education or home economics education must consult their department chairperson regarding the proper time to file this application.

(3) The student must pass the health examination required of teachers in the school system in which the student teaching is performed. A health certificate must be presented at the time of registration for student teaching. Forms may be secured from the Office of Student Teaching.

(4) The student must have a grade-point average of 2.5 or higher on all college work and a grade-point average of 2.5 or higher in professional education courses, in each of the two teaching fields (for secondary teaching), and in the fields of academic specialization (for early childhood and elementary majors).

(5) The student must have 12 semester hours of English courses with a minimum grade-point average of 2.25. The minimum grade-point average can be waived by demonstrated proficiency at the fiftieth percentile or above on an English proficiency test administered by the University.

Recommendation for Teacher Certification. A citizen of the United States or a person who has filed an intent to become a naturalized citizen, who has maintained the levels of performance stated as prerequisites for admission to student teaching, and who has demonstrated knowledge and understanding related to the nature of our multicultural society and the education of handicapped pupils is eligible to apply during the last semester of certification work to the College of Education for a recommendation to the Texas Education Agency for the appropriate teaching certificate. Beginning May 1, 1986, persons recommended for certification must achieve a satisfactory level of performance on one or more examinations prescribed by the State Board of Education.

Certificate Programs. Certificate programs have been approved for Texas Tech University at the elementary level and at the secondary level. In addition, all-level programs have been approved in certain fields which qualify the individual for certification in a special subject at both the elementary and secondary levels.

To insure the completion of certificate requirements within the time normally required for graduation, students must observe the course sequence in professional education listed in this catalog.

1. *Teachers of Young Children.* A student seeking certification to teach children ages three through eight must earn a bachelor's degree and complete approximately two years of course work in academic foundations, a minimum of 37 semester hours in academic specialization courses, and 31 semester hours in professional education. The requirements in professional education include 6 semester hours of student teaching. The area of academic specialization includes specified courses in child development, parenting, nutrition, art, music, physical education, and family relations.

2. *Elementary:* A student seeking certification to teach in the elementary (grades 1-8) schools must earn a bachelor's degree and complete approximately two years of course work in academic foundations, a minimum of 36 semester hours in academic specialization courses, and 30 semester hours in professional education and elementary content courses. The requirements in professional education include 6 semester hours in student teaching. A program leading to a kindergarten endorsement may be completed in conjunction with the satisfaction of the requirements for an elementary certificate.

Areas of academic specialization are anthropology, art, bilingual education, biology, deaf education, earth science, English, French, generic special education, geography, German, health education, history, home economics, mathematics, music, physical education, political science, psychology, reading, sociology, Spanish, and speech.

3. *Secondary:* A student seeking a certificate to teach in the secondary (grades 7-12) schools must earn a bachelor's degree and complete approximately two years of course work in academic foundations, 18 semester hours in professional education courses, including 6 semester hours in student teaching, and a minimum of 48 hours in academic specialization. In completing the requirements in academic specialization, a student may select one of three routes (plans) to a certification objective. Plan I requires a student to elect two fields (subjects) in which he or she expects to teach and to complete a minimum of 24 semester hours in each. At Texas Tech, the selection may be made from the following:

Anthropology
Biology
Business Education
Chemistry
Dance
Deaf Education
Drama
Earth Science
Economics
English
French
Generic Special Education
Geography
German
Health Education
History
Journalism
Latin
Mathematics
Physical Education
Physical Science
Physics
Political Science
Psychology
Reading
Sociology
Spanish
Speech

The student following Plan I must consult the chairperson of the academic departments in which he or she plans to qualify for certification in order to determine the specific courses which are required. Advisement for business education, generic special education, and reading is conducted in the College of Education.

Plan II is sometimes referred to as the broad field or composite program. This plan requires the completion of at least 48 semester hours in a broad field. Such composite programs do not require an additional teaching field. At Texas Tech, the student who elects to follow Plan II may select one of the following broad fields:

Art
Business Education
English
Music
Science
Social Science

Students who expect to teach in one of the broad fields listed above should consult the academic department in which they plan to complete the courses required in the composite area.

Vocational education is restricted to those who are preparing to teach in the vocational fields; at this university, agricultural education and home economics education meet the requirements set forth in the State Plan for Vocational Education. A student who wishes to obtain a certificate in either vocational agriculture or home economics education should consult the chairperson of the appropriate department regarding course requirements.

4. *All-Level:* All-level certificate programs (grades 1-12) are approved at Texas Tech University in the following fields:

Art
Music
Physical Education

The student qualifying for an all-level certificate must earn a bachelor's degree and must complete the course work prescribed for the certificate. The chairperson of the appropriate department must be consulted regarding the details of the student's academic specialization.

5. *Special Education:* The generic special education program is incorporated as a specialization within the elementary certificate program or one of the teaching fields within the secondary certificate program. Other special education endorsements are offered at the graduate level. Students interested in the education of the deaf or speech and hearing therapy should consult the Department of Speech and Hearing Sciences and enroll in the College of Arts and Sciences.

6. *Bilingual Education:* The bilingual education certificate program is incorporated as a specialization within the elementary certification program.

Professional Certificate Programs. The professional certificate is the highest teacher's certificate issued in Texas. Each program leading to professional certification is designed to prepare the applicant for a specific professional position. The professional certificate may be issued to a person who (1) has earned a bachelor's degree, (2) has at least three years of teaching experience, (3) has completed graduate course work in an approved program, and (4) is recommended by the Director of Teacher Certification. If properly planned, all the graduate work required for a professional certificate may be applied toward a master's degree.

At Texas Tech University, professional certification programs are approved in the following areas:

Elementary
- Composite Areas
- Reading

Secondary
- Biology
- Business Education
- English
- French
- German
- Health Education
- History
- Mathematics
- Music
- Physical Education
- Political Science
- Psychology
- Reading
- Spanish

Special Education
- Educational Diagnostician

Vocational Education
- Agriculture
- Home Economics

Special Services
- Principal
- Superintendent
- Counselor
- Reading Specialist
- Supervisor
- Visiting Teacher

A student wishing to work toward a professional certificate should first consult the Office of Teacher Certification to obtain information regarding the programs available. Application for admission to graduate study for the certificate should be made at the same time.

Graduate Degrees and Professional Certificates. A student who wishes to work toward a graduate degree and professional certificate should consult the Dean of the Graduate School regarding degree requirements and the Office of Teacher Certification regarding certification requirements.

Uniform Undergraduate Degree Requirements

All bachelor's degrees conferred by Texas Tech University are based on the satisfactory completion of specific authorized degree programs. A student's major subject is the degree program in which he or she is working. The degree programs are offered through the six instructional colleges of the University and are usually supervised by the departments in each college.

Requirements for undergraduate degrees, therefore, are established at these three different levels: (1) the University as a whole (Uniform Undergraduate Degree Requirements), (2) the college through which the degree is conferred, and (3) the particular degree program in which the student is working. Students should familiarize themselves with all three sets of requirements which must be fulfilled before the degree is granted.

Immediately following are explanations of the Uniform Undergraduate Degree Requirements of the University which apply to all undergraduate degrees conferred.

Residence Credit. The minimum actual residence required of each student is two consecutive semesters or the equivalent, and the minimum amount of residence work required is 30 semester hours applicable toward the degree sought. In addition, the student must complete the last 30 hours at Texas Tech, but these may include a maximum of 6 semester hours in correspondence course work, pro-

vided the minimum residence and course work requirements stated above have been met and provided the correspondence courses are not the final advanced courses in the major and minor fields.

Course work taken through the Division of Continuing Education at Texas Tech University or at any other institution will not be counted as residence credit.

The term "residence" as a degree requirement should not be confused with "residence" in the state of Texas for enrollment purposes. Residence credit as used here means credit for work done while enrolled in and attending classes at Texas Tech University.

Quality Points. A minimum grade-point average of 2.00 is required for graduation. The grades on all courses which the student takes at Texas Tech are used in determining this average, with these exceptions:

1. When a course has been repeated, only the grade made on the last registration is used, and
2. When a student transfers from one college to another within the University, grades of F and WF are not used, provided they were made prior to the first such transfer.

These provisions apply only when the grade-point average is calculated for meeting degree requirements.

Application for Degree. A candidate should file an application for a degree in the academic dean's office at least two semesters in advance of graduation and must file it not later than the beginning of the semester in which he or she expects to receive the degree. Veterans must file a degree plan by the time they have accumulated 64 semester hours.

Students who register in the semester or summer session in which they expect to complete the work for a bachelor's degree, but who have less than the number of grade points required for graduation, will be granted only conditional admission to candidacy. In this status, students act on their own responsibility in making graduation arrangements.

Required History and Political Science. Under state law all students who receive bachelor's degrees from Texas Tech University must complete 6 hours in American history. Students will normally fulfill this requirement by completing HIST 2300 and 2301. However, this requirement may be satisfied by juniors and seniors by completing any 6 hours from among the American history courses listed under the Department of History portion of the catalog. Also, 3 semester hours of Texas history may be substituted for 3 of the American history hours. (Students who receive the maximum of 6 hours credit by examination for HIST 2300, 2301 must take or have taken an additional 3-hour classroom U.S. history course to meet the state requirement for graduation.)

Under state law, all students also must have received credit for 6 semester hours in political science, covering the federal and Texas constitutions. Students will normally fulfill this requirement by completing POLS 2301, which is a prerequisite for all other political science courses, and POLS 2302. If a student earns a grade of A or B in POLS 2301, he or she may substitute in place of POLS 2302 one of the upper-level courses marked with an asterisk in the course list under the Department of Political Science portion of the catalog. (Permission of the instructor may be required for such substitution.) Students who receive the maximum of 6 hours credit by examination for POLS 2301, 2302 must take or have taken an

additional 3-hour classroom political science course to meet the state requirement for graduation.

Required Physical Education. Completion of two semesters of physical education activity courses is a requirement for all bachelor's degrees, with the exceptions noted below. Normally, students will enroll in and complete these courses during their freshman year. Credits in physical education activity courses or substitutes are accepted through transfer to the extent that they meet degree requirements; however, grade points earned in such courses may not be applied to reduce a grade-point deficiency acquired in other subjects.

Exceptions:

1. When approved by the student's academic dean, band may be substituted for physical education.
2. Students who qualify for participation in aerospace studies or military science may take the basic courses (two semesters) of the four-year ROTC program or the two-year (two semesters) ROTC program in place of physical education. Once entered upon, the satisfactory completion of these courses becomes a requirement for graduation unless the student is specifically excused by the Department of Aerospace Studies or the Department of Military Science and the student's academic dean.
3. Any student who has been honorably discharged from the Armed Forces with a minimum of 90 days' service may receive credit for the 2 semester hours in physical education required as part of the curriculum. Application for this credit must be made in the first semester of attendance at the University following honorable discharge.
4. A student over 25 years of age may substitute a 2- or 3-semester hour course in health education for the required two semesters in physical education activity work. A list of approved health education courses may be obtained from the Department of Health, Physical Education, and Recreation.
5. Students who have a doctor's recommendation for limited physical activity must enroll in the appropriate physical education activity courses. For further information, see the section on the Department of Health, Physical Education, and Recreation in this catalog.

Graduation Under a Particular Catalog. A student is expected to complete the degree requirements set forth in a particular University catalog. Normally this will be the catalog in effect at the time the student enters a post-secondary school program, assuming that it has not changed from the original degree objective. For the student who changes a degree objective after beginning a college career, the degree requirements in effect when the student first registers in the college from which the degree is to be received will be applicable. Only with the specific approval of the academic dean may a different catalog be selected. In no case may a student complete the requirements set forth in a catalog more than seven years old. When necessary, a catalog issued later than the student's first registration may be selected by the academic dean in conference with the student.

The annual *Undergraduate Catalog* is published in the spring, and its provisions apply during the following school year, September through August. However, a student who registers for the first time in the University during a summer

session is subject to the degree requirements set forth in the catalog effective for the fall semester immediately following the initial enrollment.

Commencement Exercises. Diplomas are awarded at the end of each semester and the summer session. Commencement exercises are held at the end of each long semester, and students who are awarded diplomas at the end of the previous summer session may take part in the fall commencement program.

Second Bachelor's Degree. No second bachelor's degree is conferred until the candidate has completed at least 24 semester hours—exclusive of credit by examination—in addition to the courses counted toward the first bachelor's degree.

Explanation of Course Offerings

Courses are designated by a subject prefix and number along with a descriptive title. The first digit in the number indicates the academic level of the course. First digits of 1, 2, 3, or 4 indicate that the course is primarily designed for the freshman, sophomore, junior, or senior year, respectively. A number of 5 or above designates a graduate course. The second digit indicates the semester-hour credit of the course. The remaining digits are the distinguishing numbers of the particular course. Thus, MATH 1350 is a freshman course carrying 3 semester hours of credit.

Courses are listed in the following section of the catalog under the name of the college and department in which they are taught. The courses are arranged numerically.

In the departmental course lists, certain information is placed in parentheses following the course title. The first figure in the parentheses indicates the semester-hour credit of the course; the second figure shows the number of lecture hours per week attended by a student enrolled in the course; and the third figure indicates the number of hours per week during which the student is in a laboratory, practice session, or other activity related to the course. For example, (3:1:4) following the listing of GEOG 3300, Introduction to Mapping, means that the course carries 3 semester hours' credit, that 1 hour per week is spent in lecture section, and that 4 hours per week are spent in the laboratory. Where only one figure appears in the parentheses, the course value in semester hours is indicated.

Courses in some areas have been cross-listed when they are part of an interdepartmental or interdisciplinary program. In this case the parentheses enclose the prefix and number of the cross-listed course.

The following index may be helpful in interpreting the subject prefixes used in the curricula sections of this catalog.

ACCT	Accounting
ADV	Advertising
AECO	Agricultural Economics
AERS	Aerospace Studies
AG E	Agricultural Engineering
AGED	Agricultural Education
AGSC	Agricultural Science
ANSC	Animal Science
ANTH	Anthropology
ARCH	Architecture
ART	Art
A&SH	Arts and Sciences Honors
ASTR	Astronomy
ATMO	Atmospheric Science
B A	Business Administration
BIOL	Biology
BLAW	Business Law
BOT	Botany
BSA	Business Secretarial Administration

C D	Child Development
C E	Civil Engineering
CET	Construction Engineering Technology
CH E	Chemical Engineering
CHEM	Chemistry
CLAS	Classics
CLHM	Classical Humanities
C LT	Comparative Literature
C S	Computer Science
C&T	Clothing and Textiles
CZEC	Czech
DAN	Dance
ECEL	Early Childhood/Elementary Education
ECO	Economics
EDCI	Educational Curriculum and Instruction
EDHE	Higher Education
EDSE	Secondary Education
EDSP	Special Education
E E	Electrical Engineering
EET	Electrical-Electronics Engineering Technology
EFL	English as a Foreign Language
E GR	Engineering Graphics
ENGL	English
ENGR	Engineering
ENTO	Entomology
EPSY	Educational Psychology
E ST	Ethnic Studies
F A	Fine Arts
FD T	Food Technology
FIN	Finance
FMHC	Family Management, Housing, and Consumer Science
F&N	Food and Nutrition
F R	Family Relations
FREN	French
G CH	Geochemistry
GEOG	Geography
GEOL	Geology
GERM	German
GET	General Engineering Technology
G PH	Geophysics
GRK	Greek
G ST	General Studies
HBRW	Hebrew
H E	Home Economics
HEED	Home Economics Education
H&FL	Home and Family Life
HIST	History
HLED	Health Education
HUM	Humanities
I E	Industrial Engineering
I S	Interdisciplinary Studies
ISQS	Information Systems and Quantitative Science
ITAL	Italian
JOUR	Journalism
LAAS	Latin American Area Studies
LAT	Latin
LING	Linguistics
L S	Library Science
M AP	Music Applied
MATH	Mathematics
MBIO	Microbiology
MCAG	Mechanized Agriculture
MCOM	Mass Communications
M CP	Music Composition
M E	Mechanical Engineering
M ED	Music Education
M EN	Music Ensemble
MET	Mechanical Engineering Technology
MGT	Management
MILS	Military Science
MKT	Marketing
M LT	Music Literature
M TE	Medical Technology
M TH	Music Theory
MUS	Music
PALA	Park Administration and Landscape Architecture
P E	Physical Education
PETR	Petroleum Engineering
PHIL	Philosophy
PHOT	Photography
PHYS	Physics
POLS	Political Science
PORT	Portuguese
PSS	Plant and Soil Science
PSY	Psychology
REC	Recreation
RELG	Religion
RHIM	Restaurant, Hotel, and Institutional Management
RUSN	Russian
R&WM	Range and Wildlife Management
SCOM	Speech Communication
SHS	Speech and Hearing Sciences
SLAV	Slavistics
SOC	Sociology
SPAN	Spanish
S W	Social Welfare
T E	Textile Engineering
TELE	Telecommunications
TH A	Theatre Arts
T T	Textile Technology
W S	Women's Studies
ZOOL	Zoology

Graduate School

Professor J. Knox Jones, Jr., *Dean*

Graduate study is much more than a continuation of undergraduate work. It is distinguished by spirit of inquiry and the desire to increase human knowledge. Graduate study should be contemplated, therefore, only by students who have demonstrated in their undergraduate programs unusual intellectual ability and the power of independent thought and investigation. For this reason, nearly all graduate schools exercise some type of selectivity in their admission of students. Selective entrance requirements are partly for the maintenance of high standards that must characterize graduate study and partly for the benefit of students in helping them decide whether they should undertake such work.

Because it recognizes its obligations to the citizens of Texas as well as to the standards mentioned above, the Graduate School of Texas Tech University makes a twofold classification of graduate students. In connection with the latter obligation, the Graduate School requires evidence of an applicant's special ability for admission to degree programs and reserves the right to decline to accept any applicant whose admission would not be to his or her best interest or that of the University. On the other hand, to fulfill its obligation to the citizens of Texas, the Graduate School makes it facilities available to a wide variety of students who are not eligible for or do not wish to become applicants for graduate degrees.

For more particulars and details on courses and degree requirements refer to the *Graduate Catalog.*

Majors and Degrees

Accounting
Master of Science in Accounting

Agricultural Economics
Master of Science

Agricultural Education
Master of Science
Master of Education

Agricultural Engineering
Master of Science in Agricultural Engineering

Agriculture
Master of Agriculture
Doctor of Philosophy

Anatomy
Master of Science
Doctor of Philosophy

Animal Breeding
Master of Science

Animal Nutrition
Master of Science

Animal Science
Master of Science

Anthropology
Master of Arts

Architecture
Master of Architecture

Art
Master of Fine Arts

Art Education
Master of Art Education

Atmospheric Science
Master of Science

Biology
Master of Science
Doctor of Philosophy

Botany
Master of Science

Business Administration
Master of Science
Doctor of Business Administration

Chemical Engineering
Master of Science in Chemical Engineering
Doctor of Philosophy

Chemistry
Master of Science
Doctor of Philosophy

Civil Engineering
Master of Science in Civil Engineering
Doctor of Philosophy

Classical Humanities
Master of Arts

Clothing and Textiles
Master of Science in Home Economics

Computer Science
Master of Science
Doctor of Philosophy

Crop Science
Master of Science

Economics
Master of Arts
Doctor of Philosophy

Education
Master of Education
Doctor of Education

Electrical Engineering
Master of Science in Electrical Engineering
Doctor of Philosophy

Engineering
Master of Engineering
Doctor of Philosophy

English
Master of Arts
Doctor of Philosophy

Entomology
Master of Science

Family Management, Housing, and Consumer Science
Master of Science in Home Economics

Fine Arts
Doctor of Philosophy

Food and Nutrition
Master of Science in Home Economics

Food Technology
Master of Science

French
Master of Arts

General Business
Master of Business Administration

Geoscience
Master of Science
Doctor of Philosophy

German
Master of Arts

History
Master of Arts
Doctor of Philosophy

Home and Family Life
Master of Science in Home Economics

Home Economics
Master of Science in Home Economics
Doctor of Philosophy

Home Economics Education
Master of Science in Home Economics

Horticulture
Master of Science

Industrial Engineering
Master of Science in Industrial Engineering
Doctor of Philosophy

Interdisciplinary Studies
Master of Arts
Master of Science

Land-Use Planning, Management, and Design
Doctor of Philosophy

Mass Communications
Master of Arts

Mathematics
Master of Arts
Master of Science
Doctor of Philosophy

Meat Science
Master of Science

Mechanical Engineering
Master of Science in Mechanical Engineering
Doctor of Philosophy

Medical Biochemistry
Master of Science
Doctor of Philosophy

Medical Microbiology
Master of Science
Doctor of Philosophy

Microbiology
Master of Science
Doctor of Philosophy

Museum Science
Master of Arts

Music Education
Master of Music Education

Music History and Literature
Master of Music

Music Theory
Master of Music

Park Administration
Master of Science

Performance
Master of Music

Pharmacology
Master of Science
Doctor of Philosophy

Physical Education
Master of Education

Physics
Master of Science
Doctor of Philosophy

Physiology
Master of Science
Doctor of Philosophy

Political Science
Master of Arts
Doctor of Philosophy

Psychology
Master of Arts
Doctor of Philosophy

Public Administration
Master of Public Administration

Range Science
Master of Science

Sociology
Master of Arts

Soil Science
Master of Science

Spanish
Master of Arts
Doctor of Philosophy

Speech and Hearing Sciences
Master of Science in Speech and Hearing Sciences

Speech Communication
Master of Arts

Sports Health
Master of Science

Statistics
Master of Science

Theatre Arts
Master of Arts
Master of Fine Arts

Wildlife Science
Master of Science

Zoology
Master of Science
Doctor of Philosophy

School of Law

Professor Byron Fullerton, *Dean*

Professors Bateman, Benson, Bubany, Cummins, Edgar, Eissinger, Krahmer, Kramer, Larkin, Lee, Phelan, Quilliam, Schoen, Skillern, Weninger, Wicker, and Wood; Associate Professors Baker, Casto, Marple, Maxwell, Murray, White, and Wunder; Assistant Professors Emanuel, Malloy, Soto, and Tucker; Lecturers Conboy and Thomas; Adjunct Professor Hunt.

An applicant for admission to the School of Law must have received, or have completed all requirements for, a baccalaureate degree from a college or university of approved standing prior to beginning work in the School of Law. An applicant's record must be of sufficiently high quality to demonstrate that he or she is qualified for the study of law. In exceptional cases, the work of the last two college years will be weighed more heavily than that of earlier years.

Additionally, an applicant must take the Law School Admission Test, which is administered four times a year throughout the United States and in many foreign countries by Law School Admission Services.

The School of Law does not prescribe a definite prelegal curriculum for its applicants. The wide range of lawyers' tasks and the difference in offerings from school to school preclude such an approach. However, there are certain goals which all students should keep in mind when planning their college program. They should strive to acquire the ability to read, write, and speak the English language well; to gain a critical understanding of human values and institutions — political, economic, and social; and to develop in themselves the power to think creatively.

Students are admitted only in the fall except in special circumstances. Applications for the following year should be submitted to the School of Law at the earliest opportunity after September 15 and no later than February 1.

For further details consult the *Law School Catalog*.

College of Agricultural Sciences

Professor Samuel Everett Curl, *Dean*

The College of Agricultural Sciences is dedicated to providing programs of excellence in teaching, research, and public service. These educational programs are designed to qualify the student for the modern agricultural and renewable natural resources industry — an industry that encompasses five closely related segments: (1) producing agricultural products; (2) supplying and manufacturing machinery, agricultural chemicals, feed, seed, and other production resources; (3) processing, storing, distributing, and other marketing functions for agricultural products; (4) planning and managing renewable natural resources, including range and wildlife management and outdoor recreation; and (5) providing technical assistance, financing, services, education, research, and communications in all sectors of the food, fiber, and natural resource complex.

As the size and complexity of farms and ranches continue to increase, more technology and management information is needed by students who plan careers as producers of farm and ranch products. Through proper selection of courses, opportunity is provided for training in the business aspects of agriculture in several subject-matter departments. Those students interested in the highly specialized scientific aspects of the industry will receive more training in mathematics, computers, and the basic sciences, followed by well-planned courses in agricultural technology. A microcomputer laboratory allows students to use the latest information-processing technology for class exercises and research projects.

The College of Agricultural Sciences provides excellent teaching, research, and public service facilities. These include a large number of well-equipped laboratories, design studios, and classrooms. A farm adjacent to the campus, a 2300-acre ranch 55 miles south of Lubbock, and a livestock arena and greenhouse—experimental garden complex on campus are used as teaching laboratories as well as for research in plant and soil science, animal science, entomology, horticulture, and range management studies. The college's agricultural field laboratories in northeast Lubbock County provide facilities for teaching and research in beef and dairy cattle, swine, horses, and sheep, as well as in crop production. Laboratory facilities also include a 15,822-acre unit at the Texas Tech University Center at Amarillo and a plant stress field laboratory at Brownfield. Field trips and participation in intercollegiate contests are also a part of the training program.

The research program in agriculture and renewable natural resources complements the teaching mission of the college by providing the information and knowledge necessary to keep faculty members current in their respective fields. Research projects provide solutions to problems facing industry and essential training for graduate students and advanced undergraduates. Various forms of public service are provided by the College of Agricultural Sciences through numerous short courses, conferences, and workshops throughout the year.

The College of Agricultural Sciences has eight departments which offer a number of degree programs with many areas of specialization. The programs for each department are described on the following pages along with listings of courses offered. Any deviation from the approved curriculum for a particular

degree must have prior approval from the chairperson of the department and the Dean of the College of Agricultural Sciences.

Academic Counseling. Each student in the college is assigned an academic counselor. Students who have not selected a major will be assigned an academic advisor by the Dean of the College of Agricultural Sciences.

Selecting a Major. If students know which course of study they wish to pursue, they should select that major field when they initially enroll. Students who are undecided about a major will be classified as nonmajors but will be assigned to a department and an academic advisor. During the first semester, they should select several introductory courses in agricultural sciences to assist in determining the preferred area for a major. A student will be expected to select a major after the first semester. Several departments offer the opportunity for a dual major program. Students interested in such a program should contact the chairperson of the specific departments involved.

General Standards and Requirements. Minimum standards and requirements of the College of Agricultural Sciences are the same as those for the University. Students are encouraged to read the section on Academic Information in this catalog.

Other requirements include the following:

1. Required freshman-level courses (those numbered at the 1000-level) should be taken during the freshman and sophomore years. Students who postpone taking these courses until the senior year must still take the courses, but credit for the hours will not apply toward the total hours required for the degree. (A senior is a student who has completed a minimum of 96 hours of course work.) The 1000-level physical education courses are exempt from this rule.
2. A student is expected to graduate under the requirements of the catalog in effect at the time of the first enrollment in the College of Agricultural Sciences.
3. Students must file an application for Senior Audit with the dean's office before or during the semester in which they are enrolled for their 96th semester hour. Substitution and elective sheets must also be filed prior to or during the semester the students are enrolled for their 96th semester hour.
4. Transfer students who plan to request the use of provisional elective transfer courses as a substitution for required courses must make such request by the end of their first semester in the College of Agricultural Sciences.

New Students. All new students should carefully read the sections on Admissions and Registration. Entering freshmen are encouraged to take examinations in English, mathematics, and similar courses for credit by examination which are usually given prior to the beginning of the fall semester. Transfer students should also read the subsections on "Admission of Transfer Students" and "Transfer of Credits from Other Colleges and Universities."

Courses for Freshman Year. AGSC 1111 and AECO 1301 (or 2305) are required for most majors in the College of Agricultural Sciences. AGSC 1111 should be taken during the freshman year. In addition, each student is required to take three additional beginning agriculture courses. One must be from Group 1, one from Group 2, and the third course may be taken from Group 1, 2, or 3.

Group 1: PSS 1311, 1321, R&WM 2302
Group 2: ANSC 1201, 1101, ENTO 2201, 2101, R&WM 2301
Group 3: FD T 2300, MCAG 1301, PALA 1301

Certain other courses at the freshman level are common to most curricula in the College of Agricultural Sciences. These may be taken in either the first or second semester (or either summer term), except where there is a sequence that should be followed such as ENGL 1301 and 1302. History and political science are normally regarded as sophomore-level courses but may also be taken in the freshman, junior, or senior year. The following courses other than those in agricultural sciences will generally be required: ENGL 1301 and 1302; CHEM 1305 and 1306 or CHEM 1307 and 1308 (plus CHEM 1101, 1102); BIOL 1401 or 1402; MATH 1320 or 1330, 1331 (certain majors require MATH 1330 and 1331); HIST 2300 and 2301; POLS 2301 and 2302.

Students may elect to take alternate history and political science courses other than HIST 2300 or 2301 or POLS 2302 to satisfy these requirements. Two suggested history courses are HIST 3335 and 3336. See the appropriate departmental sections in this catalog for other alternate history and political science courses.

A typical group of courses for the first semester freshman would be AGSC 1111, BIOL 1401 or 1402, ENGL 1301, MATH 1320 or 1330, and two agricultural science courses listed above. Students with a good background of chemistry in high school might prefer to take CHEM 1305 or 1307 instead of one of the agricultural science courses. A normal course load would be 14 to 18 hours.

Graduate Study. Programs are available through the College of Agricultural Sciences leading to the degree of Doctor of Philosophy with options in Agricultural Economics, Agronomy, Animal Science, Range and Wildlife Science, Range Science, and Wildlife Science. An interdisciplinary doctoral program in Land-Use Planning, Management, and Design is also available. The Master of Science degree is also offered with majors in Agricultural Economics, Agricultural Education, Agricultural Engineering, Animal Breeding, Animal Nutrition, Animal Science, Crop Science, Entomology, Food Technology, Horticulture, Meat Science, Park Administration, Range Science, Soil Science, and Wildlife Science. The college also offers the Master of Agriculture degree and the Master of Education degree in Agricultural Education. Details concerning these programs are in the *Graduate Catalog*.

Courses in Agricultural Science. (AGSC)

1111. The Agricultural Industry (1:1:0). An overview of agriculture with special topics including orientation, career guidance, and current trends.

3300. Internship (3:3:0). Prerequisite: Approval of department chairperson in student's major department. A supervised study course providing in-service training and practice in the various areas of agricultural sciences. May be repeated for credit.

Department of Agricultural Economics

Professor Kary Mathis, Chairperson.

Horn Professor Williams; Thompson Professor Bennett; Professors Graves, Lee, and Roy; Associate Professors Davis, Ethridge, Freeman, Hughes, Kennedy, Owens, and Stoecker.

This department supervises the following degree programs: AGRICULTURAL ECONOMICS, *Bachelor of Science and Master of Science; Doctor of Philosophy* in AGRICULTURE with an option in Agricultural Economics.

Agricultural economics, the business side of agriculture, applies business methods to producing, distributing, and consuming agricultural goods and services. Agricultural economists are concerned with decision-making not only on farms and ranches producing food and fiber, but also in related businesses that provide farmers and ranchers with materials, services, and credit as well as those that process, market, and distribute products to consumers.

The major objective of the department is to teach students to think independently and to use economic principles in making decisions. Students also develop skills in basic economics, agricultural sciences, mathematics, statistics, and communication.

The department prepares graduates to manage agribusiness firms, farms, ranches, and related industries and to direct real estate activities, land and property development, and financial investment. Graduates are also prepared for advanced study in agricultural economics, law, economics, or related areas.

The department provides areas of undergraduate emphasis in agribusiness management, agricultural finance, farm management, ranch management, general agricultural economics, prelaw, and real estate. Training in farm appraisal, agricultural policy, price analysis, and agricultural marketing also is provided. The department reserves the right to require a C or better in courses considered departmental core courses.

Courses in Agricultural Economics. (AECO)

1301. Introduction to Agricultural Economics (3:3:0). Basic concepts, principles, and applications of agricultural economics.

2305. Fundamentals of Agricultural Economics (3:3:0). Basic training in fundamental economic principles and their application to agricultural problems.

2306. Principles of Marketing Agricultural Products (3:2:3). Prerequisite: AECO 1301 or 2305 or approval. Introduction to the marketing of agricultural products emphasizing marketing costs, margins, and functions and showing applications of economic principles to marketing problems.

2307. Elementary Methods of Quantitative Analysis in Agricultural Economics (3:3:0). Prerequisite: AECO 2305, MATH 1320, or approval. Analytical methods and applications to problems in agricultural economics, time series analysis, correlation and regression, linear and nonlinear relationships, and elementary calculus applied to selected economic concepts and problems.

3301. Livestock Marketing (3:3:0). Prerequisite: AECO 1301 or 2305 and approval. Organizational structure and adjustments in livestock-meat industry, emphasizing prices and pricing; grades and grading; regulatory programs; foreign trade; and futures trading.

3302. Agricultural Finance (3:3:0). Prerequisite: AECO 1301 or 2305. Basic principles of agricultural finance emphasizing costs and returns from use of capital and credit, types and sources of credit, development, characteristics, and role of agricultural lending institutions.

3303. Cooperatives in Agriculture (3:3:0). Prerequisite: AECO 2306. Organization and operation of agricultural cooperatives.

3304. Farm and Ranch Management (3:2:3). Prerequisite: AECO 1301 or 2305 or approval. Organization and management of the individual farm.

Agricultural Economics Curriculum.

Specialization:			
Agribusiness Management or Agricultural Finance		Farm Management or Ranch Management	
Fall	**Spring**	**Fall**	**Spring**
FIRST YEAR			
AGSC 1111	AECO 2305	AGSC 1111	AECO 2305
ENGL 1301	ENGL 1302	ENGL 1301	ENGL 1302
MATH 1320	CHEM 1306	MATH 1320	HIST 2300
CHEM 1305	CHEM 1102	CHEM 1305	CHEM 1306
CHEM 1101	HIST 2300	CHEM 1101	CHEM 1102
Basic agriculture (6 hrs.)	Basic agriculture (3 hrs.)	Basic agriculture (6 hrs.)	Basic agriculture (3 hrs.)
P.E., Band, or ROTC	P.E., Band, or ROTC	P.E., Band, or ROTC	P.E., Band, or ROTC
SECOND YEAR			
AECO 2307	AECO 3304	AECO 3302	AECO 2307
BIOL 1401 or 1402	ACCT 2300	AECO 3304	AECO 3301
ENGL 2309 or 3365	SCOM 3308	HIST 2301	POLS 2301
HIST 2301	POLS 2301	BIOL 1401 or 1402	ENGL 2309 or 3365
AECO 2306	ECO 2311	ECO 2311	PSS 3421
	*Elective (3 hrs.)		*Elective (3 hrs.)
THIRD YEAR			
AECO 3302	ECO 3323	AECO 3315	AECO 4201
POLS 2302	AECO 3401	AECO 3401	AECO 3316
ACCT 2301	AECO 3316	POLS 2302	AECO 3317
AECO 3315	AECO 3317	ACCT 2300	SCOM 3308
*Elective (6 hrs.)	*Elective (3 hrs.)	*Elective (3 hrs.)	ACCT 2301
			*Elective (3 hrs.)
FOURTH YEAR			
AECO 4201	AECO 4100	AECO 4100	AECO 4314 or 4315
AECO 4305	AECO 4301	AECO 4301	*Elective (12 hrs.)
*Elective (10 hrs.)	AECO 4315	AECO 4303	
	AECO 4302	*Elective (9 hrs.)	
	*Elective (6 hrs.)		

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.

*Select from the following:

Agribusiness Management — 28 hours of electives must include 9 hours of junior or senior courses in business administration or economics.

Agricultural Finance — 28 hours of electives must include AECO 4303, 4304, 4316, and ECO 4323. AECO 4314 may be substituted for AECO 4315.

Farm Management — 30 hours of electives must include MCAG 3301 or 3302, 3303, PSS 2432, 3321, 3323, 4335, and 6 hours of junior or senior courses in agricultural sciences.

Ranch Management — 30 hours of electives must include R&WM 3303, 4302, ANSC 3302, 3304, 3305, AECO 3312, and 6 hours of junior or senior courses in agricultural sciences.

Real Estate		General Agricultural Economics	
Fall	**Spring**	**Fall**	**Spring**
	FIRST YEAR		
AGSC 1111 ENGL 1301 MATH 1320 CHEM 1305 CHEM 1101 Basic agriculture (6 hrs.) P.E., Band, or ROTC	AECO 2305 ENGL 1302 HIST 2300 BIOL 1401 or 1402 Basic agriculture (3 hrs.) P.E., Band, or ROTC	AGSC 1111 ENGL 1301 MATH 1320 CHEM 1305 CHEM 1101 Basic agriculture (6 hrs.) P.E., Band, or ROTC	AECO 2305 ENGL 1302 CHEM 1306 CHEM 1102 HIST 2300 Basic agriculture (3 hrs.) P.E., Band, or ROTC
	SECOND YEAR		
AECO 3304 HIST 2301 PSS 2432 ENGL 2309 AECO 2307	SCOM 3308 POLS 2301 ACCT 2300 ECO 2311 Elective (3 hrs.)	AECO 3304 AECO 2307 BIOL 1401 or 1402 HIST 2301 SCOM 3308 ECO 2311	AECO 2306 or 3301 ENGL 2309 ACCT 2300 POLS 2301 *Elective (3 hrs.)
	THIRD YEAR		
AECO 3315 AECO 3401 POLS 2302 ACCT 2301 BLAW 3393 *Elective (3 hrs.)	ECO 3311 FIN 3332 AECO 3316 AECO 3317 *Elective (6 hrs.)	AECO 3302 AECO 3315 AECO 3401 POLS 2302 ACCT 2301	AECO 4201 AECO 3316 AECO 3317 AECO 4302 or 4304 *Elective (6 hrs.)
	FOURTH YEAR		
AECO 4100 AECO 4201 AECO 4303 AECO 4313 FIN 3334 *Elective (4 hrs.)	AECO 4301 *Elective (12 hrs.)	AECO 4303 or 4317 AECO 4100 AECO 4301 AECO 4305 *Elective (6 hrs.)	AECO 4314 or 4315 *Elective (13 hrs.)

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.

*Select from the following:

Real Estate — 28 hours of electives must include at least 15 hours from BLAW 3391, 3392, 3395, FIN 3320, 4324, 4326, 4333, SOC 3361, 3322, ECO 3302, 3303, 4334, PALA 2401, 4303, R&WM 3303, 3301, 3101, 3304, 4302, AG E 2401, ANSC 3302, 3305, AECO 3313, 3314, 3305, 4302, 4316.

General Agricultural Economics — 28 hours of electives must include at least 9 hours selected from upper level courses in one area of study. Special plans are available for agricultural education, rural economic development, or advanced degrees in agricultural economics or law.

3305. Farm and Ranch Estate Planning (3:3:0). Prerequisite: Junior standing or approval. Estate planning for farmers and ranchers, planning goals and goal conflicts, analysis of planning instruments, and federal estate tax and gift taxes as applied to farmers and ranchers.

3312. Range and Ranch Economics (3:3:0). Prerequisite: AECO 1301 or 2305 and junior standing or approval. Organization and management of ranch business, emphasizing resource and enterprise combinations, prices, and marketing, ranch records, financing, appraisal, and range conservation. Short field trips.

3313. Farm and Ranch Tax Management (3:3:0). Prerequisite: Junior standing or approval. Study of farm and ranch management alternatives for minimizing federal tax liabilities. Emphasis is placed on tax-related management decisions unique to farms and ranches. Consideration is given to farm produce sales, expenses, and depreciable property acquisition and sales.

3314. Farm Laws (3:3:0). Legal problems and practices affecting the farmer and his business.

3315. Agricultural Price Theory (3:3:0). Prerequisite: AECO 1301 or 2305 and junior standing or approval. Basic economic principles with applications to agricultural pricing problems and resource allocations.

3316. Production Economics (3:3:0). Prerequisite: AECO 3315 or approval. Basic tools of economics used to analyze problems facing the farm business, emphasizing the decision-making process.

3317. Agricultural Marketing Economics (3:3:0). Prerequisite: AECO 3315 or approval. Economic principles applied to marketing problems, pricing, costs, market structure, marketing programs, and research procedures.

3401. Agricultural Statistics (4:3:3). Prerequisite: Junior standing and 3 hours of mathematics. Principles and procedures involved in the analysis of agricultural data including indices of central tendency and dispersion; probability; sampling; significance tests; analysis of variance; and simple linear correlation.

4100. Seminar (1:1:0). Prerequisite: Senior standing. Assigned readings, informal discussion, outside speakers, and written and oral reports on subjects relating to agricultural economics.

4101. Current Problems in Agricultural Economics (1). Topics may vary. May be repeated twice for credit.

4201. Agricultural Economics Methodology for Research and Management (2:2:0). Prerequisite: Junior standing and approval. Philosophy of science and research in the social sciences as applied to practical problems in agricultural economics, with emphasis on approaches to the solution of problems in economics and management.

4301. Special Problems in Agricultural Economics (3). Prerequisite: AECO 4201 or approval. Individual instruction and assigned research on a problem of interest to the students. May be repeated with approval of department chairperson.

4302. Statistical Methods in Agricultural Research (3:3:0). Prerequisite: AECO 3401. Advanced agricultural statistical analysis related to research methods using probability theory; tests of statistical significance; multiple correlation and regression; analysis of covariance; and experimental design.

4303. Farm and Ranch Appraisal (3:2:3). Prerequisite: Senior standing or approval. Factors governing land prices and valuation. Appraisal of lands for use, sale, making loans, condemnation, settlement of estates, and taxation. Appraisal reports.

4304. Agricultural Price Analysis (3:3:0). Prerequisite: AECO 3401 and 3315 or approval. Analysis of agricultural price variations, trends, cycles, seasonal variations, and statistical analysis of price changes.

4305. Agricultural Policies and Organizations (3:3:0). Prerequisite: Junior standing or approval. Historical development and economic analysis of public programs and policies affecting agriculture, emphasizing the role of farm organizations, economic effects of alternative programs, and current developments.

4306. Trade in Agricultural Products (3:3:0). Prerequisite: Junior standing and AECO 3315 or approval. Economic principles of interregional and international trade, location, and inter-area competition in agricultural products.

4312. Mathematical Economics and Econometrics for Agriculture (3:3:0). Prerequisite: AECO 3315 and 3401 or equivalents. Mathematical tools necessary for treatment of basic economic relationships involving prices and quantities, inputs and outputs, and costs and revenue. Formulation and analysis of economic models applicable to agriculture.

4313. Agricultural Resource Economics (3:3:0). Prerequisite: Junior standing or approval. Economics of agricultural resource allocation including land economics and economics of water development, allocation, and conservation.

4314. Advanced Farm Management (3:2:3). Prerequisite: AECO 3304 or approval. Advanced principles and practices emphasizing methods and techniques for analyzing farm organization and operation problems; enterprise budgeting, case studies, computer games, linear programming, and farm business simulation.

4315. Agricultural Business Management (3:2:3). Prerequisite: AECO 3315 or approval. Managerial techniques applied to decision-making problems of agricultural business firms in the procurement, handling, storage, processing, and distribution of agricultural inputs and products.

4316. Agricultural Financial Analysis (3:3:0). Prerequisite: AECO 3315 or approval. Principles and procedures concerned with managing financial and credit resources; nature, purposes, and use of financial statements, budgets, and credit instruments; and criteria for decision-making in borrowing and lending.

4317. Commodity Futures Trading and Analysis (3:3:0). Prerequisite: Approval. History and characteristics of commodity futures markets, mechanics of trading, hedging and speculation, use of futures as a business management tool, and analytical techniques involved in hedging and trading.

Department of Agricultural Education

Associate Professor Jerry Stockton, Chairperson.
Professor Eggenberger; Associate Professor Cepica; Assistant Professor Dillingham.

This department supervises the following degree programs: AGRICULTURAL EDUCATION, *Bachelor of Science, Master of Science,* and *Master of Education.* Students seeking teacher certificates should see the section entitled "Teacher Education." A curriculum for a general agricultural education specialization and a curriculum for a specialization in agricultural communications follow the teaching certification curriculum.

Agricultural Education Curriculum.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
BIOL 1401, Biology of Plants or BIOL 1402	4	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	HIST 2300, Hist. of U.S. to 1877	3
MATH 1330, Intro. Math. Anal. or MATH 1320	3	CHEM 1305, Ess. Chem. I	3
*Basic agriculture	6	CHEM 1101, Exp. Gen. Chem. I	1
P.E., Band, or ROTC	1	*Basic agriculture	3
	18	P.E., Band, or ROTC	1
			17

SECOND YEAR

Fall		*Spring*	
CHEM 1306, Ess. Chem. II	3	AGED 3201, Intro. to Ag. Ed.	2
CHEM 1102, Exp. Gen. Chem. II	1	ENTO 3201, Field Crop Insects or ENTO 3202	2
ENGL 2309 or 3365, Tech. Writing	3	MCAG 2201, Ag. Mech.-Metalwork	2
MCAG 2200, Ag. Mech.-Woodwork	2	SCOM 3308, Bus. & Prof. Spch.	3
POLS 2301, Amer. Govt., Org.	3	ENTO 2201, Intro. Ento.	2
HIST 2301, Hist. of U.S. since 1877	3	ENTO 2101, Intro. Ento. Lab.	1
	15	POLS 2302, Amer. Pub. Pol.	3
			15

THIRD YEAR

Fall		*Spring*	
MCAG 2301, Farm Elec.	3	AECO 3304, Farm Mgt.	3
PSS 2432, Prin. & Pract. Soils	4	MCAG 3303, Small Gas Eng.	3
PSS 3421, Fund. Prin. of Gen.	4	EPSY 3330, Ed. Psych.	3
ANSC 3301, Prin. of Nutri.	3	ANSC 3302, Livestock Prod.	3
R&WM 3303, Range Mgt. Prin. or PSS 3323	3	Elective	6
	17		18

FOURTH YEAR†

Fall		*Spring*	
EDCI 4323, Audio-Visual Ed.	3	AGED 4101, Prog. Develop.	1
‡Agriculture elec.	13	AGED 4201, Adult Methods	2
	16	AGED 4304, High School Meth.	3
		AGED 4303, Supv. Farm & FFA	3
		AGED 4306, Student Techg. (twice)	6
		MCAG 4305, Cond. Ag. Mech. Prog.	3
			18

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
*See Courses for Freshman Year.
†First and second semesters of senior year are interchangeable. Approximately half of the senior students qualifying to teach vocational agriculture will take the agricultural education work the first semester, and the other half will take it the second semester.
‡Students will select one of the plans listed below according to their interest. Selection of one of these plans will not prevent a student from teaching in the other vocational agriculture areas.
Production Agriculture: 13 hrs. of advanced agricultural credit in two or more departments.
Preemployment Laboratory in General Agricultural Mechanics: MCAG 2202, 3301, 4302.
Preemployment Laboratory in Meats: ANSC 2301, 3101, 3201.
Preemployment Laboratory in Feedlot: ANSC 4302, 4401.
Preemployment Laboratory in Agricultural Chemicals: PSS 3325 and ENTO 4301.
Preemployment Laboratory in Ornamental Horticulture: PSS 3312, 3314.

General Agricultural Education Specialization.

Students who do not desire a vocational agriculture teaching certificate but are interested in the diversified agricultural education curriculum will make the following changes in the Agricultural Education Curriculum.

Substitute	MCAG 3301 or 4302	for MCAG 4305
	AGED 4301	for AGED 4304
	AGED 4302	for AGED 4303
	AGSC 3300 (twice)	for AGED 4601.

Agricultural Communications Specialization.

Basic Science Courses: 12 hours*

BIOL 1401	Biology of Plants
BIOL 1402	Biology of Animals
CHEM 1101	Experimental General Chemistry I (Laboratory)
CHEM 1102	Experimental General Chemistry II (Laboratory)

CHEM 1305	Essentials of Chemistry I
CHEM 1306	Essentials of Chemistry II
PSS 3421	Fundamental Principles of Genetics

General Courses: 24 hours

ENGL 1301, 1302	College Rhetoric
ENGL 2309 or 3365	Technical Writing
HIST 2300, 2301	American History
POLS 2301, 2302	American Government
MATH 1320, 1330	College Algebra or Mathematical Analysis

Communications Courses: 38 hours

SCOM 3308	Business & Professional Speech Communication
MCOM 1300	Introduction to Mass Communications
TELE 3310	Introduction to Telecommunications
ADV 3310	Principles of Advertising
JOUR 3310	News Writing
JOUR 3312	Reporting
PHOT 2301	Basic Photography
JOUR 4480	Editing
AGED 4301	Agricultural Educational Problems
AGED 4302	Transfer of Agricultural Technology

Plus additional 7 hours** of communications courses.

Agricultural Sciences Courses: 43 hours

AGSC 1111	Agricultural Industry
AECO 1301	Introduction to Agricultural Economics

Plus 21 hours from the following: PSS 1321, ANSC 1201 and 1101, ENTO 2201 and 2101, FD T 2300, AG E 1301, PALA 1301, PSS 1311 or 1312, R&WM 2301, 2301.

Plus additional 18 hours** of upper level agricultural sciences courses.

Free electives: 15 hours**

Hours required for graduation, exclusive of P.E., ROTC, or Band — 132.

*Must complete at least 4 hours of chemistry and 4 hours of biology.
**Additional hours must be approved by the academic advisor and the dean.

Courses in Agricultural Education. (AGED)

3201. Introduction to Agricultural Education (2:1:2).

4101. Program Development for High School Vocational Agriculture (1:1:0).

4201. Methods in Adult Agricultural Education (2:1:2).

4301. Agricultural Education Problems (3). Prerequisite: Senior standing and approval of department chairperson. Individual investigation. May be repeated for credit.

4302. Transfer of Agricultural Technology (3:3:0). Prerequisite: Junior standing or departmental approval. Examination of processes by which professional agriculturalists influence the introduction, adoption, and diffusion of technological change.

4303. Methods in Supervised Farming and Future Farmer Work (3:2:3).

4304. Methods of Teaching Vocational Agriculture in the High School (3:2:3).

4306. Student Teaching (3). Prerequisite: Senior standing in agricultural education. One-half semester of off-campus, supervised student teaching. Enrollment required twice in one semester for a total of 6 credit hours.

Department of Agricultural Engineering and Technology

Associate Professor Marvin J. Dvoracek, Chairperson.

Professors Eggenberger, Grub, and Ulich; Associate Professor Foerster; Assistant Professor Dillingham; Lecturer Greiner.

This department supervises the following degree programs: AGRICULTURAL ENGINEERING, *Bachelor of Science in Agricultural Engineering, and Master of Science in Agricultural Engineering;* and MECHANIZED AGRICULTURE, *Bachelor of Science.* The Agricultural Engineering degree program is jointly administered by the College of Agricultural Sciences and the College of Engineering.

The Agricultural Engineering Department is primarily concerned with the application of basic engineering principles to the conditions and requirements of agriculture both as an industry and as a field of applied science. This responsibility is discharged through teaching and research activities for service to agriculture and with the development and training of professional agricultural engineers and agriculture majors in mechanized agriculture. Appropriate course offerings and laboratory facilities are available in the areas of farm power and machinery, buildings and structures, electrification, environment, processing, soil conservation, irrigation, and water management. Courses are offered in both Agricultural Engineering and Mechanized Agriculture.

Expanding agricultural mechanization, to produce needed food and fiber, has caused an increasing demand for agricultural engineering and mechanization graduates. Current need emphasis includes agricultural environment control, machine and structural design, resource conservation, and various services by engineers; also agribusiness, production, sales, and service. Many graduates move rapidly into management positions. Employment is well distributed among business and industrial organizations, individual private enterprises, educational institutions, and government agencies.

Agricultural Engineering Curriculum.

FIRST YEAR

Fall		*Spring*	
AG E 1301, Engr. Analysis	3	POLS 2301, Amer. Govt., Org.	3
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. Chem. I (Lab.)	1	CHEM 1104, Prin. of Chem. II (Lab.)	1
PSS 1321, Agri. Plant Science	3	E GR 1306, Engr. Graphics I	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	16*		16*

SECOND YEAR

Fall		*Spring*	
AG E 2401, Plane & Topo. Surv.	4	C E 2301, Statics	3
ANSC 3302, Livestock Prod.	3	C E 2210, Proc. Prob. Anal. I	2
MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
PHYS 1308, Prin. of Phys. I	3	PHYS 2301, Prin. of Phys. II	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	PHYS 1106, Prin. of Phys. II (Lab.)	1
Elective (humanity)	3	**POLS 2302, Amer. Pub. Pol.	3
		†Elective (technical)	3
	17		18

THIRD YEAR

Fall		*Spring*	
AG E 3301, Prin. Ag. Mach. or M E 3314	3	C E 3305, Mech. of Fluids	3
C E 3302, Dynamics	3	E E 2303, Elec. Sys. Anal.	3
C E 3303, Mech. of Solids	3	M E 3321, Engr. Thermo. I	3
MATH 3350, Math. for Engrs.	3	PSS 2432, Prin. & Pract. Soils or C E 3321 and 3121	4
••HIST 2300, Hist. of U.S. to 1877	3	‡Elective (technical)	3
Elective (humanity)	3		16
	18		

FOURTH YEAR

Fall		*Spring*	
AG E 4100, Seminar	1	Elective (general)	3
••HIST 2301, Hist of U.S. since 1877	3	#Elective (technical)	12
#Elective (technical)	13		15
	17		

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 133.
•Exclusive of P.E., Band, or ROTC.
••See catalog for other history and political science courses satisfying graduation requirements.
†Must be engineering instrumentation.
‡Must be engineering materials.
#Technical electives for concentration areas as below:

Power and Machinery	Soil and Water	General
AG E 4303, 4304, 4306	AG E 4302, 4307, 4401	AG E 4303, 4304, 4305,
M E 4335, 4336	C E 3105, 3354, 4355	4306, 4307, 4308,
plus 6 hrs. engr. sci.	plus 6 hrs. engr. sci.	4401
and 4 hrs. engr. des.	and 2 hrs. engr. des.	plus 3 hrs. engr. sci.

Mechanized Agriculture Curriculum, Production Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
PSS 1321, Ag. Plant Science	3	CHEM 1305, Ess. of Chem. I	3
ANSC 1201, Anim. Science	2	CHEM 1101, Exp. Gen. Chem. I (Lab.)	1
ANSC 1101, Anim. Science (Lab.)	1	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	MATH 1321, Trigonometry	3
MATH 1320, Coll. Algebra	3	MCAG 2200, Ag. Mech. I	2
MCAG 1301, Prin. of Ag. Mech.	3	P.E., Band, or ROTC	1
P.E., Band, or ROTC	1		16
	17		

SECOND YEAR

Fall		*Spring*	
CHEM 1306, Ess. of Chem. II	3	AG E 2401, Plane & Topo. Surv.	4
CHEM 1102, Exp. Gen. Chem. II (Lab.)	1	POLS 2301, Amer. Govt., Org.	3
•HIST 2300, Hist of U.S. to 1877	3	•HIST 2301, Hist. of U.S. since 1877	3
PHYS 1306, Gen. Phys.	3	MCAG 2301, Farm Elec. & Util.	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	PHYS 1307, Gen. Phys.	3
MCAG 2201, Ag. Mech. II	2	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
SCOM 1301, Interpersonal Comm.	3		17
	16		

THIRD YEAR

Fall		*Spring*	
AG E 3101, Envirn. Safety	1	ENTO 3201, Field Crop Ins. or ENTO 3202 or 3203	2
ENTO 2201, Intro. Ento.	2	FD T 2301, Basic Food Proc. Proced. or FD T 2300	3
ENTO 2101, Ento. Lab.	1	PSS 2432, Prin. & Pract. Soils	4
*POLS 2302, Amer. Pub. Pol.	3	MCAG 3303, Small Gas. Eng.	3
MCAG 3301, Ag. Prod. Mach.	3	**Emphasis	6
MCAG 3302, Irrig. Prin. & Pract.	3		
**Emphasis	3		
	16		18

FOURTH YEAR

Fall		*Spring*	
AG E 4100, Seminar	1	MCAG 4303, Proc. Ag. Prod.	3
ANSC 3302, Lvstk. Prod. or PSS 3323	3	MCAG 4301, Farm Mech. Prob. or ENGL 2309 or 3365	3
PALA 4304, Watershed Mgt.	3	General elective	9
MCAG 4302, Farm Bldgs. & Envir. Cont.	3	**Emphasis	3
General elective	3		
**Emphasis	3		18
	16		

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
All electives must be approved by department chairperson.
*See catalog for other history and political science courses satisfying graduation requirements.
**At least one additional course in business or economics; management; plant science; animal science; and range management.

Mechanized Agriculture Curriculum, Agricultural Business Management Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 2305, Fund. Ag. Eco.	3
CHEM 1305, Ess. Chem. I	3	CHEM 1306, Ess. Chem. II	3
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1320, Coll. Algebra	3	*HIST 2300, Hist. of U.S. to 1877	3
MCAG 1301, Prin. Ag. Mech.	3	MATH 1321, Trigonometry	3
PSS 1321, Ag. Plant Science	3	P.E., Band, or ROTC	
P.E., Band, or ROTC			
	17		16

SECOND YEAR

Fall		*Spring*	
AECO 2306, Prin. Mkt. Ag. Prod.	3	AECO 3303, Coops. in Ag.	3
ACCT 2303, Using Acct. Info.	3	AG E 2401, Plane & Topo. Surv.	4
MCAG 2301, Farm Elec.	3	ENGL 2309, Patt. of Repts.	3
PSS 2432, Prin. & Pract. Soils	4	*POLS 2301, Amer. Govt., Org.	3
*HIST 2301, Hist. of U.S. since 1877	3	MCAG 2300, Computers in Ag.	3
	16		16

THIRD YEAR

Fall		*Spring*	
AECO 3302, Ag. Finance or FIN 3323	3	AECO 3316, Prod. Eco. or ECO 3320	3
AECO 3315, Ag. Price Theory or ECO 3312	3	MCAG 3303, Small Gas Engines	3
AG E 3101, Rural Environ. Safety	1	MCAG 3302, Irrig. Prin. & Pract.	3
ANSC 3302, Livestock Prod.	3	MCAG 4301, Farm Mech. Prob.	3
MCAG 3301, Ag. Prod. Mach.	3	SCOM 3308, Bus. & Prof. Speech	3
*POLS 2302, Amer. Pub. Pol.	3	Elective (general)	3
	16		18

FOURTH YEAR

Fall		*Spring*	
AECO 3317, Ag. Mkt. Eco. or MKT 3350	3	AECO 3401, Ag. Stat. or ISQS 2445	4
AECO 4315, Ag. Bus. Mgt.	3	AECO 4316, Ag. Financial Anal.	3
AG E 4100, Seminar	1	MCAG 4303, Proc. Ag. Prod.	3
BLAW 3391, Business Law I	3	Elective (general)	7
MCAG 4302, Farm Buildings	3		
Elective (general)	3		17
	16		

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
*See catalog for other history and political science courses satisfying graduation requirements.

Courses in Agricultural Engineering. (AG E)

1301. Engineering Analysis I (3:3:0). The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. FORTRAN programming. Synthesis and analysis of typical engineering problems.

2301. Engineering Instrumentation and Control Systems (3:2:3). Basic engineering measurements and instrumentation for measurement of physical, environmental, and chemical parameters of length, area, volume, temperature, pressure, flow, velocity, power, moisture, etc.; instrument calibration, techniques, and operations in measurement of geometric, thermal, pressure, power, atmospheric, and other environmental properties.

2401. Plane and Topographic Surveying (4:3:3). Precision measurement of distances, areas, and elevations. Includes traversing, photogrammetry, plane table, transit, stadia, horizontal curves, topographic mapping, and construction layout.

3101. Rural Environmental Safety (1:1:0). Prerequisite: Junior classification. Study of rural environmental hazards and accidents. Causes and analytical solution including elements of equipment and facility safety designs. Consists of lectures and design problems.

3301. Principles of Agricultural Machinery (3:2:3). Mechanical design and materials used for farm machinery construction. Includes materials, design principles, machine types, capacity, maintenance, and effective use.

3302. Agricultural and Engineering Materials (3:2:3). Prerequisite: Chemistry and physics. Introduction to engineering and agricultural materials; metals, woods, polymers, grains, fibers, and plastics; strength, density, hardness, and other properties; testing and quality control; uses of materials.

4100. Agricultural Engineering Seminar (1:1:0). Assigned readings, oral and written reports, discussions, lectures by visiting professional engineers, and field trips required.

4301. Agricultural Engineering Problems (3). Individual investigation of a technical or design problem. Systematic retrieval, research, and a final written report required.

4302. Drainage of Agricultural Lands (3:3:0). Origin and nature of drainage problems in agricultural lands; drainage theories; design of surface and subsurface drainage systems; land reclamation; leaching requirements; drainage law.

4303. Elements of Farm Tractor Design (3:2:3). Theory of internal combustion engines; thermodynamic principles; kinematics and dynamics of tractor chassis and power transmission including drawbar, hydraulic, and power-take-off; and traction mechanism.

4304. Farm Electrification Systems (3:2:3). Farm electric distribution systems; wiring, controls, motor applications, refrigeration, heating, lighting, and ventilation. Special applications as applied to the agricultural industry.

4305. Structural Design of Farm Buildings (3:2:3). Structural design of farm buildings and estimation. Includes load and stress analysis, axial loading, columns, beams, connections, foundation, floors, framing and roofs.

4306. Agricultural Processing Systems (3:2:3). Engineering principles in agricultural product conveyance, processing, and storage. Includes materials handling, treatment, and packaging of fibers, feeds, and food.

4307. Design of Farm Irrigation Systems (3:2:3). Design of gravity and sprinkler irrigation systems; including well drilling development, pumping, structures, conveyance, and efficiency control.

4308. Environmental and Functional Design of Agricultural Structures (3:2:3). Biological response of plants and animals to environment. Engineering analysis and design of environmental structures; including heating, cooling, lighting, ventilation, and humidity.

4401. Engineering for Soil and Water Conservation (4:3:3). Engineering aspects and design of soil and water conservation structures; including terraces, diversions, drops, chutes, spillways, drainage systems, earthen dams, and runoff determination.

Courses in Mechanized Agriculture. (MCAG)

1301. Principles of Agricultural Mechanization (3:3:0). Modern agricultural equipment requirements, development, and application. Emphasis on selection, use, and maintenance of power units, equipment, and structures. Includes engineering applications to resource conservation.

2200. Agricultural Mechanics I — Woodwork (2:1:3). Selection, use, and maintenance of hand tools and power woodworking equipment. The selection and estimation of materials and wood and concrete construction.

2201. Agricultural Mechanics II — Metalwork (2:1:3). Hand and power tools for farm metal work. Includes welding and cold metal work for construction and repairs.

2202. Agricultural Surveying and Land Conservation (2:1:3). Measurement of distances and areas, traversing, elevations, and mapping. Includes laying out terraces and ditches for water control.

2300. Computers in Agriculture (3:2:2). Introduction to the computer, its history, operation, and applications in agriculture. Includes characteristics of computer hardware and software, accessing the computer, and interpretation of output.

2301. Farm Electrification (3:2:2). Essential principles of electricity, electrical systems, and electrical devices including AC and DC motors; design and installation of farmstead wiring systems and electric motor selection, application, and service.

3301. Agricultural Production Machinery (3:3:0). The development, classification, operation, adjustment, maintenance, and repair of farm production machines. Includes tillage, planting, cultivating, and harvesting machinery.

3302. Irrigation Principles and Practices (3:3:0). Overview of irrigation including water sources, quality, movement, and use by plants; wells and pumps; methods of application; scheduling.

3303. Small Gasoline Engines and Tractor Maintenance (3:2:3). Fundamentals of internal combustion engines, principally small gasoline engines. Emphasis on

adjustments, repair, and routine maintenance to include tractors and other power units.

4301. Farm Mechanics Problems (3). Individual study of an advanced phase of farm mechanization or farm mechanics. Research report required.

4302. Farm Buildings and Environment Control (3:3:0). Determining farm building requirements, materials, design, and construction. Includes framing, environment control methods, equipment, and necessary utilities.

4303. Feed and Fiber Processing Systems (3:3:0). Agricultural materials processing, handling, and storage systems for feed, food, and fiber applications.

4305. Conducting Agricultural Mechanics Programs (3:2:2). Organization, equipment, and management of vocational agricultural shops. Advanced techniques in design and construction of projects. Emphasis on welding and fabrication.

Department of Animal Science

Professor Jack E. McCroskey, Chairperson.

Thornton Professor Preston; Professors Albin, Curl, Hudson, Long, Ramsey, and Tribble; Associate Professors Galyean, Miller, Orr, and Richardson; Assistant Professors Clark, Craddock, Davis, and Heird; Lecturer Hellman; Adjunct Professors Buddingh and Willham.

This department supervises the following degree programs: *Bachelor of Science* in ANIMAL BUSINESS, ANIMAL PRODUCTION, and ANIMAL SCIENCE; *Master of Science* in ANIMAL BREEDING, ANIMAL NUTRITION, ANIMAL SCIENCE, and MEAT SCIENCE; and *Doctor of Philosophy* in AGRICULTURE with an option in Animal Science. The Department of Animal Science also directs the curriculum in preveterinary medicine. Degree requirements are given below. All electives are subject to departmental approval.

Animal Business Curriculum.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 2305, Prin. of Eco.	3
ANSC 1201, Gen. Anim. Sci.	2	CHEM 1305, Ess. Chem. I	3
ANSC 1101, Gen. Anim. Sci. Lab.	1	CHEM 1101, Exp. Gen. Chem. I	1
BIOL 1402, Biol. of Animals	4	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	ANSC 2301, Lvstk. & Meat Eval. I	3
MATH 1320, Coll. Algebra or MATH 1330	3	*Basic agriculture	3
*Basic agriculture	3	P.E., Band, or ROTC	1
P.E., Band, or ROTC	1		17
	18		

SECOND YEAR

Fall		*Spring*	
AECO 2306, Prin. Mkt. Ag. Prod.	3	AECO 3316, Prod. Eco.	3
ANSC 2203, Anat. & Phys. Dom. Ani. I	2	AECO 3315, Ag. Price Theory	3
ACCT 2303, Using Acct. Info.	3	POLS 2301, Amer. Govt., Org.	3
CHEM 1306, Ess. Gen. Chem. II	3	ANSC 2204, Anat. Dom. Anim. II	2
CHEM 1102, Exp. Gen. Chem. II (Lab.)	1	HIST 2301, Hist. of U.S. since 1877	3
HIST 2300, Hist. of U.S. to 1877	3	CHEM 3401, Intro. Org. Chem.	4
**Elective	3		18
	18		

THIRD YEAR

Fall		*Spring*	
AECO 3301, Lvstk. Mkt. or AECO 3317	3	AECO 3401, Ag. Statistics or ISQS 2445	4
ANSC 3201, Sel., Proc. Meats	2	ANSC 3102, Lvstk. Rations	1
ANSC 3101, Sel., Proc. Meats Lab.	1	ANSC 3301, Prin. Nutr.	3
BLAW 3391, Bus. Law I	3	ANSC 3304, An. Genetics	3
POLS 2302, Amer. Pub. Pol.	3	SCOM 3308, Bus. & Prof. Spch.	3
ENGL 2309, Patt. of Reports	3	••Elective	3
••Elective	3		—
	—		17
	18		

FOURTH YEAR

Fall		*Spring*	
ANSC 4100, An. Sci. Seminar	1	ANSC 4307, An. Nutrition	3
ANSC 4401, Swine Prod.	4	ANSC 4308, Beef Prod.	3
••Elective	8	••Elective	9
	—		—
	13		15

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
•See Courses for Freshman Year.
••Select 6 hours from ANSC 4302, 4305, 4306, and 4309; 6 hours from AECO 3303, 4305, 4315, 4316, and 4317; 3 hours of business administration; and 11 hours of free electives.

Animal Production Curriculum.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Inudstry	1	AECO 1301, Int. Ag. Eco. or AECO 2305	3
BIOL 1402, Biol. of Animals	4	CHEM 1305, Ess. Chem. I	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1101, Exp. Gen. Chem. I	1
MATH 1320, Coll. Algebra or MATH 1330	3	ENGL 1302, Adv. Coll. Rhetoric	3
ANSC 1201, Gen. Ani. Sci.	2	ANSC 2301, Lvstk. & Meat Eval. I	3
ANSC 1101, Gen. Ani. Sci. Lab.	1	•Basic agriculture	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	—		—
	15		17

SECOND YEAR

Fall		*Spring*	
ANSC 2201, Pract. In Ani. Sci.	2	ANSC 2204, Anat. Dom. Ani. II	2
ANSC 2203, Anat. Dom. Ani. I	2	PSS 2432, 3321, or R&WM 3303	3-4
CHEM 1306, Ess. Chem. II	3	CHEM 3401, Intro. Org. Chem.	4
CHEM 1102, Exp. Gen. Chem. II	1	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3	HIST 2300, Hist of U.S. to 1877	3
•Basic agriculture	3		—
••Elective	3		15-16
	—		
	17		

THIRD YEAR

Fall		*Spring*	
ANSC 3201, Sel., Proc. Meat	2	ANSC 3301, Prin. of Nutr.	3
ANSC 3101, Sel., Proc. Meat Lab.	1	ANSC 3304, Anim. Genetics	3
ANSC 3401, Repro. Physiol.	4	ANSC 3306 or 4304	3
PSS 3421, Fund. Prin. Gen.	4	MBIO 3400, Microbiology	4
ENGL 2309, Patt. of Repts.	3	SCOM 3308, Bus. Prof. Spch.	3
HIST 2301, Hist. of U.S. since 1877	3		—
••Elective	1		16
	—		
	18		

FOURTH YEAR

Fall		*Spring*	
ANSC 4100, An. Sci. Seminar	1	ANSC 4307, An. Nutrition	3
ANSC 4401, Swine Prod.	4	ANSC 4308, Beef Prod.	3
••Elective	12	••Elective	12
	17		18

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
*See Courses for Freshman Year.
••Must include 3 hours of ANSC 4302, 4305, 4306, 4309; 10-13 hours of free electives plus 11-12 hours from any of the following: AGSC 3300, ANSC 2202, 2302, 3202, 3203, 3204, 3303, 4201, 4301, 4302, 4303, 4304, 4305, 4306, 4309, 4310, AECO 3301, 3304, 3312, 4303, MCAG 2200 or 2202, 2201, and 3303.

Animal Production Curriculum, Ranch Management Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 2305, Prin. of Eco.	3
ANSC 1201, Gen. Anim. Sci.	2	CHEM 1305, Ess. Chem. I	3
ANSC 1101, Gen. Anim. Sci. Lab.	1	CHEM 1101, Exp. Gen. Chem. I (Lab.)	1
BIOL 1402, Biol. of Animals	4	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	ANSC 2301, Lvstk. & Meat Eval. I	3
MATH 1320, Coll. Algebra or MATH 1330	3	*Basic agriculture	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	15		17

SECOND YEAR

Fall		*Spring*	
PSS 2432, Prin. Pract. Soils	4	ACCT 2303, Using Acct. Info.	3
ANSC 2201, Pract. in Anim. Sci.	2	ENGL 2309, Patt. of Repts.	3
ANSC 2203, Anat. Dom. Anim. I	2	POLS 2301, Amer. Govt., Org.	3
R&WM 2301, Intro. Wildlife	3	ANSC 2204, Anat. Dom. Anim. II	2
CHEM 1306, Ess. Gen. Chem. II	3	HIST 2301, Hist. of U.S. since 1877	3
CHEM 1102, Exp. Gen. Chem. II (Lab.)	1	••Elective	3
HIST 2300, Hist. of U.S. to 1877	3		17
	18		

THIRD YEAR

Fall		*Spring*	
R&WM 3302, Range Plant Ecol.	3	R&WM 3303, Range Mgt. Prin.	3
AECO 3315, Ag. Price Theory	3	ANSC 3301, Prin. Nutr.	3
POLS 2302, Amer. Pub. Pol.	3	ANSC 3304, Anim. Genetics	3
PSS 3421, Genetics	4	SCOM 3308, Bus. & Prof. Speech	3
••Elective	3	••Elective	4
	16		16

FOURTH YEAR

Fall		*Spring*	
MCAG 2300, Computers in Ag.	3	ANSC 4100, Anim. Sci. Seminar	1
AECO 3312, Range & Ranch Eco.	3	ANSC 4308, Beef Prod.	3
R&WM 4302, Range Improve.	3	R&WM 4303, Range Anal. & Mgt. Plan.	3
AECO 3301, Lvstk. Mkt. or AECO 3317	3	ANSC 4306, Sheep, Wool, Mohair Prod.	3
••Elective	6	••Elective	4
	18	†Elective (production)	3
			17

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
*See Courses for Freshman Year.
**Must include 13 hours with 6 selected from MGT 3370, 3373, BLAW 3391, 3392, or 3395, and 7 hours selected from ANSC 4302, 4303, 4309, 4401, AECO 3305, 3313, 3314, 4303, 4316, 4317, R&WM 4304, 4309; plus 7 hours of free electives.
†ANSC 4302, 4309, or 4401

Animal Science Curriculum.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Int. Ag. Eco. or AECO 2305	3
BIOL 1402, Biol. of Animals	4	CHEM 1307, Prin. Chem. I	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1103, Prin. Chem. I (Lab.)	1
ANSC 1201, Gen. Animal Sci.	2	ENGL 1302, Adv. Coll. Rhetoric	3
ANSC 1101, Gen. Anim. Sci. Lab.	1	ANSC 2301, Lvstk. & Meat Eval. I	3
*MATH 1350, Anal. Geom.	3	**Basic agriculture	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	15		17

SECOND YEAR

Fall		*Spring*	
ANSC 2201, Pract. in Ani. Sci.	2	CHEM 3305, Org. Chem.	3
ANSC 2203, Anat. & Phys. Dom. Ani. I	2	CHEM 3105, Org. Chem. Lab.	1
CHEM 1308, Prin. Chem. II	3	ANSC 2204, Anat. Dom. Ani. II	2
CHEM 1104, Prin. Chem. II (Lab.)	1	SCOM 3308, Bus. & Prof. Spch.	3
ENGL 2309, Patt. of Repts.	3	HIST 2300, Hist. of U.S. to 1877	3
MATH 1351, Calculus I	3	POLS 2301, Amer. Govt., Org.	3
**Basic agriculture	3		15
	17		

THIRD YEAR

Fall		*Spring*	
PSS 3421, Fund. Prin. Gen.	4	ANSC 3301, Prin. of Nutr.	3
CHEM 3306, Org. Chem.	3	ANSC 3304, An. Genetics	3
CHEM 3106, Org. Chem. Lab.	1	POLS 2302, Amer. Pub. Pol.	3
HIST 2301, Hist. of U.S. since 1877	3	†Elective	9-10
ANSC 3401, Repro. Physiol.	4		18-19
ANSC 3201, Sel., Proc. Meat	2		
ANSC 3101, Sel., Proc. Meat Lab.	1		
	18		

FOURTH YEAR

Fall		*Spring*	
ANSC 4100, An. Sci. Seminar	1	ANSC 4307, An. Nutrition	3
ANSC 4401, Swine Prod.	4	ANSC 4308, Beef Prod.	3
†Elective	12	†Elective	10
	17		16

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
*Any mathematics course taken to prepare for this course will be counted as a provisional elective credit.
**See Courses for Freshman Year.
†Must include 3 hours of ANSC 4302, 4305, 4306, 4309; 16 hours chosen from AECO 3401, AGSC 3300, PSS 2432, BIOL 3302, 3420, CHEM 3402, 4306, 4307, MATH 1352, MBIO 3401, PHYS 1306, 1103, 1307, 1104, ZOOL 2405, 3301, 4304, 4306, 4409, ANSC 3306, 4301, 4303, 4310; and 13 hours of free electives.

Preveterinary Medicine Curriculum.

This curriculum is designed to qualify students for entrance into schools of veterinary medicine. Students who complete this curriculum may either apply for admission to a school of veterinary medicine or change to one of the four-year curricula in the College of Agricultural Sciences.

The minimum course requirements for enrollment in a professional veterinary medicine curriculum will normally be 67 semester hours of acceptable credit and would include the following courses and semester hours listed: animal science — 6 (to include animal nutrition); biology — 6 (botany and zoology); chemistry — 16; English — 9; genetics — 3; history — 6 (U.S. history); mathematics — 3 (college calculus); physics — 8; and political science — 6 (U.S. national and Texas state and local government). Two hours of P.E., Band, or ROTC will be required if the student plans to complete requirements for a B.S. degree.

Preveterinary medicine majors should not take required courses pass/fail.

Following is a suggested sequence of courses to complete these requirements.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	BIOL 1401, Biol. of Plants	4
BIOL 1402, Biol. of Anim.	4	CHEM 1308, Prin. Chem. II	3
CHEM 1307, Prin. Chem. I	3	CHEM 1104, Prin. Chem. II (Lab.)	1
CHEM 1103, Prin. Chem. I (Lab.)	1	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	MATH 1351, Calculus I	3
ANSC 1201, Gen. Animal Sci.	2	HIST 2300, Hist. of U.S. to 1877	3
ANSC 1101, Gen. Anim. Sci. Lab.	1		—
	—		17
	15		

SECOND YEAR

Fall		*Spring*	
CHEM 3305, Org. Chemistry	3	CHEM 3306, Org. Chem.	3
CHEM 3105, Org. Chem. Lab.	1	CHEM 3106, Org. Chem. Lab.	1
ENGL 2309, Patt. of Repts.	3	ANSC 3301, Prin. of Nutr.	3
POLS 2301, Amer. Govt., Org.	3	PSS 3421, Genetics	4
PHYS 1306, Gen. Phys.	3	POLS 2302, Amer. Pub. Pol.	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	PHYS 1307, Gen. Phys.	3
HIST 2301, Hist. of U.S. since 1877	3	PHYS 1104, Exp. Gen. Phys. I (Lab.)	1
	—		—
	17		18

Effective fall 1985, the following semester hour credits will also be required for admission into the professional veterinary curriculum by Texas A&M University: biochemistry — 5; general microbiology — 4; computer science — 4; and entomology — 3.

Courses in Animal Science. (ANSC)

1101. General Animal Science (Laboratory) (1:0:2). Prerequisite: Concurrent registration with ANSC 1201. Demonstration and application of lecture material with cattle, horses, sheep, and swine.

1201. General Animal Science (2:2:0). Corequisite: ANSC 1101. An introductory course designed to orient the student in the modern field of animal agriculture. Emphasis on problems of breeding, feeding, management, and marketing.

2201. Practicum in Animal Science (2:0:2). Prerequisite: ANSC 1101 and 1201. Hands-on experience of routine techniques and practices with cattle, sheep, swine, and horses.

2202. Selection and Evaluation of Horses (2:0:4). Prerequisite: ANSC 1101, 1201 or approval of instructor. Criteria for evaluation and selection of breeding and show animals. Evaluation of breed types and show ring characteristics. Field trips to various breed operations. Horse judging teams will originate from this course.

2203. Anatomy and Physiology of Domestic Animals I (2:2:0). Prerequisite: ANSC 1201 and 1101. Introduction to the anatomy and physiology of domestic animals. The anatomy and physiology of the nervous, skeletal, muscular, and circulatory systems.

2204. Anatomy and Physiology of Domestic Animals II (2:2:0). Prerequisite: ANSC 2203. A continuation of ANSC 2203 with emphasis on the digestive, urinary, reproductive, and endocrine systems.

2301. Livestock and Meat Evaluation I (3:2:3). Prerequisite: ANSC 1201, 1101. Evaluation and selection of breeding and market animals, carcass evaluation and grading, breed characteristics. Field trips to ranches and meat packing plants.

2302. Livestock and Meat Evaluation II (3:1:6). Advanced training in evaluating, selecting, pricing, and grading of breeding and market livestock, carcasses, and wholesale cuts. Field trips to ranches and meat packing plants. Livestock and meat judging teams originate from this course. May be repeated for credit.

3101. Selection, Care, Processing, and Cooking of Meats (Laboratory) (1:0:2). Prerequisite: Concurrent registration with ANSC 3201. Personal and demonstrative experience of lecture material in ANSC 3201. Visits to meat packing plants and retail markets.

3102. Livestock Rations (1:0:2). Prerequisite: ANSC 1201, 1101, and concurrent enrollment in ANSC 3301. Nutritional requirements of farm animals, feed compositions, and ration formulation.

3201. Selection, Care, Processing, and Cooking of Meats (2:2:0). Corequisite: ANSC 3101 for animal science and food technology majors. A general course in selecting, preserving, inspecting, grading, and cooking meats.

3202. Horse Judging and Selection (2:0:4). Advanced training in evaluation and selection. Detailed training in judging breeding animals and show ring classes. Advanced judging team members will come from this course or its equivalent.

3203. Livestock and Meat Judging (2:0:6). Prerequisite: ANSC 1201, 1101, 2301, and 2302. In-depth special training in livestock and meat judging, grading and evaluation for students who wish to become members of the livestock or meat judging teams. May be repeated for credit.

3204. Advanced Livestock and Meat Judging (2:0:6). Prerequisite: ANSC 1201, 1101, 2301, 2302, 3203. Advanced training in livestock and meat judging, grading, and evaluating for students who wish to become members of the livestock or meat judging teams. May be repeated for credit once.

3205. Management and Training of Horses (2:0:4). Prerequisite: ANSC 3303. A practicum on routine techniques of handling and training horses of various ages.

3301. Principles of Nutrition (3:3:0). Prerequisite: ANSC 1201, 1101, CHEM 1306. Concurrent enrollment in ANSC 3102 by animal science majors. Digestibility and energy value of feeds. Feeding standards and calculation of rations for maintenance, growth, fattening, and for milk, wool, and egg production.

3302. Livestock Production (3:3:0). The application of scientific and technological advances to production practices in range beef cattle, sheep and goats, swine production and feedlot practices. Not open to animal science majors.

3303. Introductory Horse Management (3:3:0). Prerequisite: Consent of instructor. Breeding, feeding, stabling, and shoeing. Gaits. Care of stallions, mares, and foals. Parasites and diseases.

3304. Animal Genetics (3:3:0). Prerequisite: PSS 3421. Genetics applied to the improvement of farm animals. Systems of breeding and selection. Systems of mating, such as inbreeding, outcrossing, and crossbreeding.

3305. Applied Animal Nutrition (3:3:0). Prerequisite: ANSC 1201, 1101, CHEM 1305, 1306. The fundamental metabolic principles of nutrition will be developed into concepts applicable to problem solving and situation use in the field. Nutrition-disease involvement. Not open to animal science majors. Will not qualify as prerequisite to ANSC 4307.

3306. Animal Sanitation and Disease Control (3:3:0). Diseases of farm animals, both infectious and noninfectious, parasites, parasitic diseases, and the establishment of immunity through the use of biological products.

3401. Reproductive Physiology (4:3:2). Prerequisite: ANSC 2203 and 2204 and junior or senior standing. Physiological approach to reproductive processes in farm animals. Study includes anatomy, endocrinology, estrous cycles, egg and sperm physiology, fertilization, gestation, parturition and artificial insemination.

4100. Animal Science Seminar (1:1:0). Assigned subjects. Review of recent investigations. Reports and discussions. May be repeated once for credit.

4201. Livestock Record Systems (2:2:0). Prerequisite: ANSC 3304. Principles of performance testing. Analysis and interpretation of actual records is a major part of the work.

4301. Special Problems in Animal Science (3). Prerequisite: Senior standing and approval of department chairperson. Individual investigation. May be repeated for credit.

4302. Beef Cattle Feedlot Management (3:3:0). Prerequisite: ANSC 3301, 3102 and junior or senior standing. The analysis of feedlot operations — design, economics, projections, bank relationships, procurement, and marketing. Customer relations and commodity hedging techniques.

4303. Feed Mill Operation and Management (3:2:3). Prerequisite: MCAG 4303. Feed mill management principles and the processing and production of feeds. Practical experience at the feed mill. Visits to commercial feed mills.

4304. Advanced Meat Science (3:2:3). Prerequisite: ANSC 3201 or consent of instructor. The study of the science of meat and meat products.

4305. Dairy Cattle Production (3:2:2). Prerequisite: Junior or senior standing. Application of scientific and technological advances in the management of dairy cattle. Management problems, solutions, practices and trends of a commercial dairy farm.

4306. Sheep and Angora Goat Production (3:2:3). Prerequisite: Junior or senior standing. Sheep, Angora goat, wool, and mohair production management and marketing practices. Field trips to ranches and feedlots.

4307. Animal Nutrition (3:3:0). Prerequisite: ANSC 3102, 3301, CHEM 3401 or 3305, 3105. The role of nutrients in the metabolism of farm animals. Nutrient use and energy efficiency in production.

4308. Beef Production (3:2:2). Prerequisite: Junior or senior standing. The breeding, feeding, and managing of beef herds for profitable production of slaughter cattle. Emphasis on commercial cow/calf herds. Field trips to ranches and feedlots.

4309. Horse Production (3:2:2). Prerequisite: ANSC 3303 and junior or senior standing. An advanced study of the feeding, breaking, training, reproduction, and genetics of horses. Diseases, care of mares, selection, and handling.

4310. Pathophysiology of Domestic Animals (3:2:3). Designed to integrate principles of physiology with mechanisms of disease processes. Emphasis on understanding pathogenesis as well as prevention and control of diseases that commonly affect milk, meat, and fiber producing animals.

4401. Swine Production (4:3:2). Prerequisite: Junior or senior standing. Characterization of the swine industry. Evaluation of production practices including breeding, reproduction, life cycle management, housing, feeding, marketing, and sanitation. Laboratory and field trips to area farms demonstrate production practices and management systems.

Department of Entomology

Associate Professor James Keith Wangberg, Chairperson.
Professor Ashdown; Assistant Professors Phillips and Whitworth; Adjunct Professors Archer, Orr, and Rummel.

This department supervises the following degree programs: ENTOMOLOGY, *Bachelor of Science, Master of Science.* A dual major in crops and entomology is available at the undergraduate level. The Department of Entomology is located in the Agricultural Sciences Building.

Entomology includes the study of the principles of biology, ecology, and agriculture and their application to the management of pest and beneficial insect populations. Summer and school year employment opportunities are offered in agricultural chemical sales and service and in research on the practical management of major insect pests of the region and the United States. Graduates are sought for positions in technical services to agriculture and sales and management in industry, teaching, and research. Elective courses are permitted to adapt the academic program to student needs. Two areas of specialization are available. The general entomology plan is for those who desire more flexibility in their program. The pest management specialization is for those who wish broader training in general agriculture.

Entomology Curriculum, General Entomology Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
ENTO 2101, Intro. Ento. Lab.	1	CHEM 1305, Ess. Chem. I	3
ENTO 2201, Intro. Ento.	2	CHEM 1101, Exp. Gen. Chem. I (Lab.)	1
BIOL 1401, Biol. of Plants	4	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	HIST 2300, Hist. of U.S. to 1877	3
MATH 1330, Intro. Math. Anal. or MATH 1320	3	*Basic agriculture	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	15		17

SECOND YEAR

Fall		*Spring*	
BIOL 1402, Biol. of Animals	4	CHEM 3401, Org. Chem.	4
CHEM 1306, Ess. Chem. II	3	ENGL 2309, Patt. of Repts.	3
CHEM 1102, Exp. Gen. Chem. II (Lab.)	1	ENTO 3301, Insect Anat. & Phys.	3
HIST 2301, Hist. of U.S. since 1877	3	*Basic agriculture	3
*Basic agriculture	3	**Applied entomology	3
**Applied entomology	2-3		16
	16-17		

THIRD YEAR

Fall		*Spring*	
ENTO 3401, Insect Taxonomy	4	ENTO 4304, Immature Insects	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
BOT 3401 or PSS 4324	4-3	SCOM 3308, Bus. & Prof. Spch. or BLAW 3391	3
Elective	3	‡Elective (science)	3
†Soils or genetics	3-4	Elective	6
	17		18

FOURTH YEAR

Fall		*Spring*	
BOT 3302, Plant Pathology	3	ENTO 4100, Seminar	1
ENTO 4305, Integ. Pest Mgt.	3	Elective	9-10
Elective	9	##Senior entomology	6
#Plant & soil science	3		
	18		16-17

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
•See Courses for Freshman Year.
••Select from ENTO 3101 and 3201 and 3202, 3203.
†Select from PSS 2431, 2432, 3421, or BIOL 3301.
‡Recommended electives include AECO 3401, PSS 4323, R&WM 3101 and 3301, ANSC 3306, BOT 3304, MBIO 3400, ZOOL 3303 or 3406.
#Select from PSS 2311, 2321, 3321, 3322, or 3324.
##Select from ENTO 4301, 4302, 4306.

Entomology Curriculum, Pest Management Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1305, Ess. Chem. I	3
MATH 1330, Intro. Math. Anal. or MATH 1320	3	CHEM 1101, Exp. Gen. Chem. I (Lab.)	1
ENTO 2201, Intro. Entomol.	2	ENGL 1302, Adv. Coll. Rhetoric	3
ENTO 2101, Intro. Ento. Lab.	1	BIOL 1402, Biol. of Animals	4
BIOL 1401, Biol. of Plants	4	P.E., Band, or ROTC	1
P.E., Band, or ROTC	1		15
	15		

SECOND YEAR

Fall		*Spring*	
ENTO 3201, Field Crop Insects	2	ENTO 3302, Livestock Pests	2
ENTO 3101, Field Crop Ins. Lab.	1	ENTO 3102, Livestock Pests Lab.	1
POLS 2301, Am. Govt., Org.	3	ENTO 3301, Insect Anat. & Phys.	3
CHEM 1306, Ess. Chem. II	3	POLS 2302, Amer. Pub. Pol.	3
CHEM 1102, Exp. Gen. Chem. II (Lab.)	1	CHEM 3401, Organic Chem.	4
•Basic agriculture	6	•Basic agriculture	3
	16		16

THIRD YEAR

Fall		*Spring*	
ENTO 3203, Hort. Pests	2	ENTO 4301, Ag. Compounds	3
ENTO 3401, Insect Taxonomy	4	ENTO 4304, Immature Insects	3
PSS 4324, Ag. Plant Phys.	3	PSS 4323, Weeds & Weed Contr.	3
••Ecology	6	PSS 2431, Soils or PSS 2432	4
	15	ENGL 2309, Patt. of Repts.	3
			16

FOURTH YEAR

Fall		*Spring*	
ENTO 4305, Integ. Pest Mgt.	3	ENTO 4100, Seminar	1
BOT 3302, Plant Pathology	3	ENTO 4302, Med. Ento. or ENTO 4306	3
ANSC 3306, An. Sanit. & Dis. Contr.	3	HIST 2301, Hist. of U.S. since 1877	3
HIST 2300, Hist. of U.S. to 1877	3	†Elective (plant & soil science)	3
†Elective (plant & soil science)	3	Elective	7
	15		17

SUMMER

ENTO 3302, 3303, Techniques in Pest Management I, II	6
AGSC 3300, Internship	3
	9

*See Courses for Freshman Year.
**Two courses chosen from R&WM 2302, BIOL 3303, or PSS 3323.
†Select from PSS 2311, 2321, 3321, or 3322.
Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.

Courses in Entomology. (ENTO)

1101. Laboratory on Insects and Man (1:0:2). Prerequisite: Concurrent enrollment in ENTO 1201 for laboratory science credit. An introductory laboratory for non-majors covering basic elements of insect biology with emphasis on the various ways insects affect human society. This course, taken in conjunction with ENTO 1201, serves as part of a basic laboratory science unit available to all majors.

1201. Life of the Insects (2:2:0). Prerequisite: Concurrent enrollment in ENTO 1101 for laboratory science credit. The role of insects in nature and their implication in the affairs of humans. This course, taken in conjunction with ENTO 1101, serves as part of a basic laboratory science unit available to all majors.

2101. Introductory Entomology Laboratory (1:0:2). Prerequisite: Concurrent enrollment in ENTO 2201 for laboratory science credit. An introduction to the biology, life history, classification, and identification of insects. Taken in conjunction with ENTO 2201, this course serves as a part of an introductory unit for agriculture and science majors.

2201. Introductory Entomology (2:2:0). Prerequisite: Concurrent enrollment in ENTO 2101 for laboratory science credit. An introductory course in entomology with emphasis on basic structure and function; behavior; and interactions with other insects, plants, and animals. Taken in conjunction with ENTO 2101, this course serves as part of an introductory unit for agriculture and science majors.

2202. Bees and Beekeeping (2:1:2). An introduction to honey bee biology and the techniques of beekeeping. Laboratories include working with live bees, managing colonies, and harvesting their products.

3101. Field Crop Insects Laboratory (1:0:3). Corequisite: ENTO 3201. Laboratory and field recognition of symptoms and identification of field crop arthropod pests.

3102. Livestock Pests Laboratory (1:0:3). Corequisite: ENTO 3202. Laboratory and field recognition of symptoms and identification of livestock arthropod pests.

3201. Field Crop Insects (2:2:0). Control tactics utilized in managing insect and mite pests in cotton, grain crops, forages, sunflowers, and stored products.

3202. Livestock Pests (2:2:0). Biology and control tactics of arthropod pests assso-ciated with livestock.

3203. Horticulture Pests (2:2:0). Biology and control tactics of arthropod pests of ornamental, vegetable, and fruit crops.

3301. Insect Anatomy and Physiology (3:2:3). Prerequisite: ENTO 2201. A study of the structure and function of insect systems.

3302. Techniques in Pest Management I (3:1:4). Prerequisite: ENTO 2201 and permission of the instructor. Primarily a field course on techniques used in the protection of plants and animals. ENTO 3303 must be completed satisfactorily before credit is given for ENTO 3302.

3303. Techniques in Pest Management II (3:1:4). A continuation of ENTO 3302. Both ENTO 3302 and 3303 must be satisfactorily completed before credit is given for either.

3401. Insect Taxonomy (4:3:3). Prerequisite: ENTO 2201 and 2101 or an introductory course in entomology. A study of the major families of insects with emphasis on their identifying features and biologies. An insect collection is required.

4100. Seminar (1:1:0). Prerequisite: Senior or advanced standing in entomology. Assigned readings, current advances, informal discussions, oral reports, and papers. May be repeated for credit.

4101. Entomology Problems (1). Prerequisite: Approval of instructor. Investigation of an assigned problem with individual instruction. May be taken in multiplicity during any given enrollment. May be repeated for credit with approval of department chairperson.

4301. Agricultural Compounds (3:3:0). Prerequisite: An introductory course in entomology and CHEM 3401. Nature, mode of action, and uses of insecticides, fungicides, herbicides, and fertilizers.

4302. Medical Entomology (3:2:3). The study of human diseases caused by arthropods and disease agents transmitted by arthropods.

4303. Insect Natural History (3:2:2). An introductory course for nonmajors. The resources of the insect as applied to our understanding of life, the animal world, and the human's relationship to insects.

4304. Immature Insects (3:2:3). Prerequisite: ENTO 2201 and 2101 or equivalent. A study of the immature forms among the major families of insects with emphasis on their identifying features and biologies. A collection of immature insects is required.

4305. Integrated Pest Management (3:3:0). Prerequisite: An introductory course in entomology. The principles and practices of integration of all available control strategies in the management of arthropod pest populations.

4306. Urban Arthropod Pests (3:2:3). Prerequisite: An introductory course in entomology. Life history, habits, recognition, and control of arthropod pests associated with households and industry.

Food Technology

Professor Jack E. McCroskey, Chairperson.
Professor Ramsey; Associate Professors Galyean and Miller; Assistant Professor Davis.

This section supervises the following degree programs: FOOD TECHNOLOGY, *Bachelor of Science* and *Master of Science*. Two areas of specialization are offered — industry and science. Degree requirements are given below.

Food technology provides the basic course work for a comprehensive background in the properties and preservation of foods. Food technology graduates may be employed in areas concerned with food systems management, design and development of new food products, strategies for quality assurance and food safety, or research in basic constituents of food. The increasing pressure of world population growth on available food supply assures a stable, growing job market for food technology students. Positions in private industry, educational institutions, and governmental agencies offer excellent potential for rapid advancement. The Food Technology section provides course work suggested by the Institute of Food Technologists and emphasizes processing and quality control aspects. A pilot plant and associated chemical and microbiological laboratories allow the student practical experience in development, manufacture, and analysis of food products.

Food Technology Curriculum, Industry Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
BIOL 1402, Biol. of Animals	4	**CHEM 1305, Ess. Chem. I or CHEM 1307	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1101, Exp. Gen. Chem. I (Lab.) or CHEM 1103	1
MATH 1330, Intro. Math. or MATH 1320	3	ENGL 1302, Adv. Coll. Rhetoric	3
F&N 1310, Sci. of Nutr. & Food or *Basic agriculture	3	MATH 1331, Intro. Math. Anal. or MATH 1321	3
ANSC 1201, Animal Science	2	*Basic agriculture	3
ANSC 1101, Gen. Anim. Sci. Lab.	1	P.E., Band, or ROTC	1
P.E., Band, or ROTC	1		
	18		17

SECOND YEAR

Fall		*Spring*	
**CHEM 1306, Ess. Chem. II or CHEM 1308	3	CHEM 3401, Intro. Org. Chem. or CHEM 3305 and 3105	4
CHEM 1102, Exp. Gen. Chem. II (Lab.) or CHEM 1104	1	HIST 2301, Hist. of U.S. since 1877	3
FD T 2300, Prin. Food Tech.	3	ENGL 2309, Patt. of Repts. or SCOM 3308	3
HIST 2300, Hist. of U.S. to 1877	3	FD T 2302, Elem. Anal. of Foods	3
F&N 2310, Prin. of Food Prep. or MCAG 2103 and 2203	3	Approved elective	3
Approved elective	3		16
	16		

THIRD YEAR

Fall		*Spring*	
POLS 2301, Amer. Govt., Org.	3	ACCT 2303, Using Acct. Info. or †Adv. Chem.	3-4
F&N 3340, Human Nutrition or Approved elective	3	ANSC 3201 and 3101, Meat Sci. I or PSS 2311	3
FD T 3304, Fruit & Veg. Proc.	3	AG E 2301, Inst. & Controls or Approved elective	3
MBIO 3400, Microbiology	4	FD T 3301, Food Micro. or FD T 4305	3
FD T 3302, Adv. Food Anal. or FD T 4303	3	POLS 2302, Amer. Pub. Pol.	3
	16	Approved elective	3
			18-19

FOURTH YEAR

Fall		*Spring*	
AECO 3401, Ag. Statistics	4	FD T 4306, Dairy Prod. Mfg.	3
FD T 4303, Food Chemistry or FD T 3302	3	FD T 4305, Proc. Oilseed & Cer. Grains or FD T 3301	3
FD T 4304, Field Studies in Food Proc.	3	Elective	10-11
Elective	6		16-17
	16		

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.
*See Courses for Freshman Year.
**A student planning to take additional chemistry courses other than CHEM 3401 should take CHEM 1307 and 1308.
†CHEM 2401, 3106, 3306, 3402.

*Food Technology Curriculum, Science Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
BIOL 1402, Biol. of Animals	4	CHEM 1308, Prin. Chem. II	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1104, Prin. Chem. II (Lab.)	1
MATH 1330, Intro. Math or MATH 1351	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1307, Prin. Chem. I	3	F&N 1310, Sci. Nutr. & Food	3
CHEM 1103, Prin. Chem. I (Lab.)	1	ANSC 1201, Animal Science	2
P.E., Band, or ROTC	1	ANSC 1101, Gen. Anim. Sci. Lab.	1
		P.E., Band, or ROTC	1
	16		17

SECOND YEAR

Fall		*Spring*	
CHEM 3401, Intro. Org. Chem. or CHEM 3305 and 3105	4	CHEM 3402, Physiol. Chem. or CHEM 3306 and 3106	4
MATH 1331, Intro. Math. Anal. or MATH 1352	3	PHYS 1306, Gen. Physics	3
FD T 2300, Prin. Food Tech.	3	PHYS 1103, Exp. Gen. Phys. I (Lab.)	1
F&N 2310, Prin. Food Prep. or Approved elective	3	FD T 2302, Elem. Anal. Foods	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
ENGL 2309, Patt. of Repts. or SCOM 3308	3	Approved elective	3
	19		17

THIRD YEAR

Fall		*Spring*	
CHEM 2401, Anal. Chem. Meth.	4	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3	FD T 3301, Food Microbiology or FD T 4305	3
F&N 3340, Human Nutrition	3	**Approved science elective	9
FD T 3302, Adv. Food Anal. or FD T 4303	3	Approved elective	3
MBIO 3400, Microbiology	4		18
	17		

FOURTH YEAR

Fall		*Spring*	
FD T 4303, Food Chemistry or FD T 3302	3	FD T 4306, Dairy Prod. Mfg.	3
FD T 4304, Field Studies	3	FD T 4305, Proc. Oilseed & Cer. Grains or FD T 3301	3
AECO 3401, Ag. Statistics	4	Elective	9
Elective	5		
	15		15

Hours required for graduation exclusive of P.E., Band, or ROTC — 132.
*Meets Institute of Food Technologists' requirements.
**Consult major advisor.

Courses in Food Technology. (FD T)

2300. Principles of Food Technology (3:3:0). Basic information necessary to understand technological aspects of modern industrial food supply systems. A fundamental background in food classification, modern processing, and quality control.

2301. Basic Food Processing Procedures (3:3:0). Descriptions of equipment and procedures used in processing major food commodity groups. Suitable for nonmajors.

2302. Elementary Analysis of Foods (3:2:3). Basic laboratory practice in food product testing. Should have had a course in chemistry or other lab science.

3301. Food Microbiology (3:2:3). Prerequisite: MBIO 3400 or permission of instructor. Microorganisms important in food spoilage and in food preservation. Study of methods for preservation of food with respect to control of microbiological growth and activity.

3302. Advanced Food Analysis (3:2:3). Prerequisite: CHEM 3401, FD T 2302, or permission of instructor. Study of laboratory techniques fundamental to establishing the nutritional value and overall acceptance of foods. Investigation of food constituents and methods used in their analysis.

3303. Food Equipment Sanitation (3:3:0). Detergency, sanitization, and equipment and product care.

3304. Fruit and Vegetable Processing (3:2:3). Practice in preserving fruits and vegetables. Suitable for nonmajors.

4301. Food Technology Problems (3). Taught on an individual basis. May be repeated for credit with permission.

4302. Control of Defects in Commercial Foods (3:3:0). Characterization of common defects in commercial food and how to correct them.

4303. Food Chemistry (3:2:3). Prerequisite: CHEM 3401 or permission of instructor. Chemical and physiochemical properties of food constituents. A comprehensive study of food components, their modification, and technology applications in food.

4304. Field Studies in Food Processing and Handling (3:1:4). Visits to food processing and handling facilities and discussions of operations.

4305. Processing Oilseeds and Cereal Grains for Foods (3:2:3). Physical and chemical characteristics of oilseeds and grains and their effects on processing. Introduction to processing principles and techniques.

4306. Dairy Products Manufacturing (3:2:3). Physical and chemical characteristics of milk and milk products. Principles involved in processing dairy foods.

Department of Park Administration and Landscape Architecture

Professor Jon E. Rodiek, Chairperson.

Professors Fish, Kitchen, and Mertes; Associate Professor Marlett; Assistant Professors Gill and Hutmacher; Instructor Ewalt; Adjunct Associate Professor Koh; Visiting Assistant Professor Hansen.

This department supervises the following degree programs: PARK ADMINISTRATION, *Bachelor of Science and Master of Science;* LANDSCAPE ARCHITECTURE, *Bachelor of Landscape Architecture.* Offices and most classroom facilities are located in the Agricultural Plant Science Building and the Landscape Architecture Pavilion.

The park administration program offers areas of specialization in administration and interpretation. Studies are directed toward developing an understanding and acquiring an expertise in planning, designing, developing, and managing parks, recreation areas, and other open spaces as integral parts of the living environment. Participation in a departmentally sponsored, nationwide field work program during the summer months is offered to add a practical dimension to the student's professional training.

The landscape architecture program exposes the student to the basic skills and knowledge required to enter the landscape architectural profession in either

the public or the private sector. This program emphasizes physical design and planning problems in the natural environment. Landscape architecture students are urged to spend summer months working in the offices of registered landscape architects, planners, and associated professionals.

The department is affiliated with the Council of Educators in Landscape Architecture, and the curriculum in landscape architecture is accredited by the American Society of Landscape Architects.

The department reserves the right to retain, exhibit, and reproduce work submitted by students. Work submitted for grade is the property of the department and remains such until it is returned to the student.

The department and faculty are associated with the Society of American Foresters, the American Society of Landscape Architects, the American Planning Association, the American Association for the Advancement of Science, the American Society of Photogrammetry, the Council of Educators in Landscape Architecture, the National Recreation and Park Association, and the National Association for Environmental Education, the Texas Parks and Recreation Society, and the Texas Chapter of the American Society of Landscape Architects. In addition, the department sponsors the annual Southwest Park and Recreation Training Institute.

The department administers a scholarship program for students with potential for high academic performance. Contact the chairperson of the department for information and scholarship application forms.

All majors in the department take a common curriculum core during their first two years.

Park Administration Curriculum.

FIRST YEAR

Fall		*Spring*	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1320, Coll. Algebra	3	*AG E 2401, Plane & Topo. Surv.	4
*PSS 1311, Prin. of Hort. or		GEOL 1303, Phys. Geol.	3
*BIOL 1401	3-4	GEOL 1101, Phys. Geol. Lab	1
*PALA 1301, Fund. Park Plan.	3	HIST 2301, Hist. of U.S. since 1877	3
HIST 2300, Hist. of U.S. to 1877	3	P.E., Band, or ROTC	1
P.E., Band, or ROTC	1		15
	16-17		

SECOND YEAR

Fall		*Spring*	
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
*PSS 2313, Herb. Plant Matls.	3	*PSS 2314, Woody Plant Matls.	3
*PALA 3306, Graphic Comm. I	3	*PALA 3307, Graphic Comm. II	3
*ENGL 2309, Patt. of Repts.	3	*PALA 2402, Land. Arch. II	4
AECO 1301, Ag. Eco.	3	*SOC 2301, Intro. to Soc.	3
*PALA 2401, Land. Arch. I	4	*PSS 2231, Intro. Urban Soils	2
	19		18

*Must be passed with a minimum grade of C and must not be taken pass/fail.

Administrative Specialization

THIRD YEAR

Fall		*Spring*	
PALA 3401, Land Arch. III	4	PALA 3402, Land. Arch. IV	4
PALA 3304, Land. Construction	3	PSS 3315, Grounds Maint. & Oper.	3
PALA 3301, Basic Park Admin.	3	PALA 2301, Nat. & Cul. Interp.	3
ENTO 2201, Intro. Ento.	2	PALA 4404, Adv. Land. Constr.	4
ENTO 2101, Intro. Ento. Lab.	1	SCOM 3308, Bus. & Prof. Speech	3
PSS 3313, Turf. Mgt.	3		—
*Directed elective	3		17
	—		
	19		

FOURTH YEAR

Fall		*Spring*	
PALA 4302, Land & Water Res.	3	PALA 4307, Mun. Rec. Admin.	3
PALA 4304, Watershed Mgt.	3	PALA 4303, Environ. Anal. & Plan.	3
PALA 4305, Revenue Prod. Act.	3	PALA 4403, Aerial Photo.	4
SOC 4362, Urban Community	3	PALA 4202, Park Administration	2
BLAW 3391, Business Law or		PALA 4100, Seminar	1
BLAW 3393, Real Est. Law	3	REC 3301, Prog. for Leisure	3
*Directed elective	3-4		—
	—		16
	18-19		

Hours required for graduation, exclusive of P.E., Band, or ROTC — 137.
*Subject to approval of the academic advisor and department chairperson.

Interpretation Specialization

THIRD YEAR

Fall		*Spring*	
PALA 2301, Nat. & Cul. Interp.	3	PALA 3303, Nat. & Cul. Interp. Tech.	3
PALA 3401, Land. Arch. III	4	PALA 3402, Land. Arch. IV	4
SCOM 1301, Interpersonal Comm.	3	SCOM 2304, Fund. of Oral Inter.	3
ENGL 2301, Mast. of Lit.	3	EPSY 3330, Educ. Psych. or	
ARCH 3354, Arch. Conserv.	3	PSY 1300	3
R&WM 2302, Ecology & Conserv.	3	BIOL 1402, Zoology or	
	—	R&WM 2301	3-4
	19		—
			16-17

FOURTH YEAR

Fall		*Spring*	
PALA 3301, Basic Park Admin.	3	PALA 4202, Park Administration	2
JOUR 3309, Report. & Edit. News	3	PALA 4100, Seminar	1
ADV 3311, Prin. Pub. Rel.	3	GEOL 3304, Land Forms & Struct.	3
ART 3362, Presentation Tech.	3	JOUR 3335, Pub. Rel. Adm.	3
*Directed elective	5	ANTH 4380, Museum Tech.	3
	—	PALA 4307, Mun. Rec. Admin.	3
	17	*Directed elective	3-5
			—
			18-20

Hours required for graduation exclusive of P.E., Band, or ROTC — 136.
Students should arrange for two summer internships to be completed before graduation.
*Subject to approval of the academic advisor and department chairperson.

Landscape Architecture Curriculum.

FIRST YEAR

Fall		*Spring*	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1320, Coll. Algebra	3	*AG E 2401, Plane & Topo. Surv.	4
*PSS 1311, Prin. of Hort. or *BIOL 1401	3-4	GEOL 1303, Phys. Geol.	3
		GEOL 1101, Phys. Geol. Lab.	1
*PALA 1301, Fund. Park Plan.	3	HIST 2301, Hist. of U.S. since 1877	3
HIST 2300, Hist. of U.S. to 1877	3	P.E., Band, or ROTC	1
P.E., Band, or ROTC	1		—
	—		15
	16-17		

SECOND YEAR

Fall		*Spring*	
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
*PSS 2313, Herb. Plant Matls.	3	*PSS 2314, Woody Plant Matls.	3
*PALA 3306, Graphic Comm. I	3	*PALA 3307, Graphic Comm. II	3
*PALA 2401, Land. Arch. I	4	*PALA 2402, Land. Arch. II	4
*ENGL 2309, Patt. of Repts.	3	*SOC 2301, Intro. to Soc.	3
AECO 1301, Ag. Eco.	3	*PSS 2231, Intro. Urban Soils	2
	—		—
	19		18

THIRD YEAR

Fall		*Spring*	
*PSS 4313, Arboriculture	3	*PALA 4304, Watershed Mgt.	3
*PALA 3302, Dev. of Land. Arch.	3	*PALA 4306, Graphic Comm. III	3
*PALA 3401, Land. Arch. III	4	*PALA 3402, Land. Arch. IV	4
*PALA 4302, Land & Water Res.	3	*PALA 4303, Environ. Anal. & Plan.	3
*PALA 3304, Land. Constr.	3	*PALA 4404, Adv. Land. Construction	4
	—		—
	16		17

FOURTH YEAR

Fall		*Spring*	
*PALA 4403, Aerial Photo.	4	*PALA 4203, Prof. Practice	2
*PALA 3403, Plant. Design	4	*PALA 4402, Land. Arch. VI	4
*PALA 4401, Land. Arch. V	4	PALA 4100, Seminar	1
*R&WM 2302, Ecology & Conserv.	3	**Directed elective	12-13
*BLAW 3391, Business Law or *BLAW 3393	3		—
	—		19-20
	18		

Hours required for graduation, exclusive of P.E., Band, or ROTC — 137.
*Must be passed with a minimum grade of C and must not be taken pass/fail.
**Subject to approval of the academic advisor and department chairperson.

Courses in Park Administration and Landscape Architecture. (PALA)

1301. Fundamentals of Park Planning (3:3:0). A basic course to develop an understanding of the interactions of man and earth and to examine fundamental principles of related environmental design disciplines.

2301. Basic Natural and Cultural Resource Interpretation (3:3:0). Basic interpretation competency for park and natural resource interpretors and communicators.

2401. Landscape Architecture I (4:1:6). A basic course in landscape architecture incorporating the elements and principles of design as each relates to the profession.

2402. Landscape Architecture II (4:1:6). Prerequisite: PALA 2401, 3306. The continuation of PALA 2401 with emphasis on the systematic approach to environmental design in various projects of small to moderate scale.

3301. Basic Park Administration (3:3:0). Prerequisite: Junior standing. A study of administration, operation, management, and history of city, county, state, and national parks.

3302. Development of Landscape Architecture (3:3:0). An overview of the history of landscape architecture.

3303. Natural and Cultural Resource Interpretation Techniques (3:3:0). Prerequisite: PALA 2301 or consent of instructor. Natural and cultural resource interpretation techniques and concepts will be examined and applied to real and simulated professionally-oriented field problems.

3304. Landscape Construction (3:2:4). Prerequisite: PSS 2231 or 2432. Introduction to the principles, materials, methods, and processes of landscape architecture construction.

3306. Graphic Communication I (3:1:4). Introduces and develops the skills necessary to communicate design thought.

3307. Graphic Communication II (3:1:4). Prerequisite: PALA 3306. A continuation of PALA 3306, emphasizing graphic techniques for the professional landscape architect.

3401. Landscape Architecture III (4:1:6). Prerequisite: PALA 2402, PSS 2313, 2314. A continuation of PALA 2402 with continued emphasis on the systematic approach to site planning and design as it applies to projects of greater size and complexity.

3402. Landscape Architecture IV (4:1:6). Prerequisite: PALA 3307, 3401. Landscape assessment for land planning, especially large-scale developments.

3403. Planting Design (4:1:6). Prerequisite: PSS 2313, 2314, R&WM 2302, PALA 3401. Selection and arrangement of plant materials for landscape architectural developments for aesthetic and other functional purposes.

4100. Seminar (1:1:0). Prerequisite: Senior standing in park administration. Assigned readings, informal discussions, and oral reports and papers.

4201. Park Administration and Landscape Architecture Problems (2). An investigation of a problem in the profession of special interest to the student. Open to all advanced students.

4202. Park Administration (2:2:0). Prerequisite: Senior standing. Analysis and evaluation of human resources development relevant to administrators of park and recreation departments in public and private sectors.

4203. Professional Practice (2:2:0). Prerequisite: Senior standing. Methods, procedures, and ethics of professional practice of landscape architecture.

4301. Park Administration and Landscape Architecture Problems (3). An investigation of a problem in the profession of special interest to the student. Open to all advanced students.

4302. Land and Water Resources for Recreation Development (3:3:0). Prerequisite: Permission of instructor. Concepts of planning management for use and conservation of land and water resources. Analysis of resources and planning techniques and their application to park and recreation facilities administration.

4303. Environmental Analysis and Planning (3:3:0). Principles and concepts of environmental land management. Course covers land use control, open space preservation strategies, legal tools in environmental management, and contemporary land management issues.

4304. Watershed Management (3:3:0). Prerequisite: Senior standing or approval of instructor. The watershed as a unit of resource-oriented planning and development. Principles and objectives of watershed management. Physical description of watershed. Relationship between land-use conditions and the water delivery character of watersheds. Watershed analysis, including techniques, collection of field data, and sources of information. Required field trips.

4305. Revenue Producing Activities and Facilities for Park and Recreation Departments (3:3:0). Prerequisite: PALA 3301 and junior or senior standing in park administration. An analysis of funding sources of park and recreation departments including local, state, federal, and private resources; compulsory, contractual, gratuitous, and earned income.

4306. Graphic Communication III (3:1:4). Prerequisite: PALA 3307. An advanced course in graphic communication for the professional, emphasizing its persuasive potential. Includes reprographic as well as manual techniques.

4307. Municipal Recreation Administration (3:3:0). Prerequisite: PALA 3301 and junior standing. Principles, techniques, issues and strategies involved in the administration and management of urban and regional park and recreation departments. Utilizes a number of case studies of each major principle discussed.

4401. Landscape Architecture V (4:1:6). Prerequisite: PALA 3402, 3403. Advanced work in a variety of comprehensive and current landscape architectural projects.

4402. Landscape Architecture VI (4:1:6). Prerequisite: PALA 4401, 4404. A continuation of PALA 4401, including a terminal project.

4403. Aerial Photo Interpretation in Natural Resource Management (4:2:4). Knowledge of trigonometry desirable. Review of principles of photogrammetry. Fundamentals of aerial photograph reading, interpretation, and evaluation with special application to management of renewable natural resources. Introduction of remote sensing techniques. A senior level course for students in the general field of natural resource management. Required field trips.

4404. Advanced Landscape Construction (4:2:4). Prerequisite: PALA 3304, 3402. Site planning and adaptation of landscape architecture construction to existing natural or man-made site conditions.

Department of Plant and Soil Science

Professor David E. Koeppe, Chairperson; Professor George Tereshkovich, Associate Chairperson.

Horn Professor Dregne; Thornton Professor Matches; Rockwell Professor Taylor; Professors Allen, Bennett, Downes, and Krieg; Associate Professors Gipson, Hopper, Zartman, and Zukauckas; Assistant Professors Keim, Munson, Reed, and Robacker; Adjunct Professors Abernathy, Brigham, Burke, Gannaway, Gausman, McMicheal, Onken, Quisenberry, Rosenow, and Wendt.

The department supervises the following degree programs: *Bachelor of Science,* SOILS, CROPS, HORTICULTURE; *Master of Science* in CROP SCIENCE, HORTICULTURE, and SOIL SCIENCE; *Doctor of Philosophy* in AGRICULTURE with an option in Agronomy. A dual major in crops and entomology is also available at the undergraduate level. Hours required for graduation are 132 plus 2 hours minimum of physical education, band, or ROTC.

Agronomy is the study of crop and soil science and the application of scientific principles to crop production and soil management. A wide variety of employment opportunities are available with federal, state, and private organizations as well as in agribusiness crop management, scientific careers, and research and development.

The general crops and soil management specializations within the department provide the student with a thorough background in the principles of crop production and soil management. The business and management area unites courses in business, finance, and accounting with technical production courses to prepare students for management in crop agriculture. The crop science and soil

science specializations include additional courses in the basic sciences such as chemistry, mathematics, and physics beyond those required in the general crops or soil management areas.

Horticulture through the application of science and art prepares people for a variety of career opportunities. A major in horticulture allows a student to concentrate work in one of these specialization areas: fruits and vegetables, ornamentals, horticultural therapy, and nursery management. Horticulture majors find not only pleasure and profit in their chosen profession, but also make a direct contribution to enhance the quality of human life and environment. This involves production, marketing, and utilization of horticultural plants.

Crops and Soils Curricula.

Core

General requirements for all majors in crops and soils (56-57 hours)

HIST 2300, 2301
POLS 2301, 2302
ENGL 1301, 1302, 2309 or 3365
PSS 1321, 2432 or 2431, 3421, 4100
R&WM 2302 or ANSC 1201 and 1101
BOT 3401 or PSS 4324
MATH 1320 or 1330
AGSC 1111
ENTO 2201 and 2101
AECO 3401
BIOL 1401
P.E., Band, or ROTC

Specializations

All crops and soils majors are required to complete one of the following specializations in addition to the above core of courses.

GENERAL CROPS (46-49 hours)

PSS 2321, 3321, 3322, 3323, 3324, 4321, 4323, 4335
CHEM 1305, 1101; 1306, 1102; 3401
AG E 2401 or MCAG 2202 or 3302
BOT 3302
ENTO 3201 or 4301
AECO 1301 or 2305

Elective: 28-32 hours

CROPS—ENTOMOLOGY (72 hours)

PSS 2321, 3321, 3322, 3323, 4321, 4323, 4335
ENTO 3201, 3101, 3203, 3301, 3302, 3303, 3401, 4301, 4304, 4305
CHEM 1305, 1101, 1306, 1102, 3401
AECO 1301
AGSC 3300
BOT 3302
MCAG 3302

Elective: 5-6 hours

SOIL MANAGEMENT (55-57 hours)

PSS 3323, 4131, 3321 or 4323, 4331, 4332, 4335, 4333 or 4334 or 4336
ATMO 2300 or GEOL 1304
CHEM 1305, 1101; 1306, 1102; 3401
ENTO 3201 or 4301
AG E 2401 or MCAG 3302
BOT 3302 or 3304
GEOL 1303
R&WM 3301, 3101
AECO 1301 or 2305

Elective: 23-26 hours

BUSINESS AND MANAGEMENT (65-66 hours)

PSS 2321, 3321, 3322, 3323, 3324, 4321, 4323, 4335
CHEM 1305, 1101; 1306, 1102; 3401
AECO 2305, 2306, 3302 or 4316, 3316, 3317 (or MKT 3350), 3315
Also select 3 hours from AECO 3303, 4305, 4315, or 4317
MCAG 2202 or 3302
ACCT 2303
SCOM 3308

Elective: 11-13 hours

CROP SCIENCE (67 hours)

PSS 2321, 3321 or 3322, 3323, 3324, 4321, 4323, 4333 or 4335, 4331 or 4332 or 4334 or 4336
CHEM 1307, 1101; 1308, 1102; 3305, 3105; 3306, 3106; 2401
AECO 1301 or 2305
PHYS 1306, 1103, 1307, 1104
BOT 3302, 3309, 4303
MATH 1321
AECO 1301 or 2305

Elective: 10-11 hours

SOIL SCIENCE (67 hours)

MATH 1350, 1351, 1352
PHYS 1306, 1103; 1307, 1104
CHEM 1307, 1101; 1308, 1102; 3401, 2501
MBIO 3400
GEOL 1303, 1101
BIOL 1402
Advanced soils — 12 hours
Advanced plant science — 6 hours
Physical, biological, earth, or atmospheric science or mathematics — 3 hours

Elective: 10-11 hours

Horticulture Curriculum, Fruit and Vegetable Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
PSS 1321, Agr. Plant. Sci.	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1305, Ess. Chem. I	3	CHEM 1306, Ess. Chem. II	3
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
MATH 1320, Coll. Algebra or MATH 1330	3	HIST 2300, Hist. of U.S. to 1877	3
ENGL 1301, Ess. Coll. Rhetoric	3	BIOL 1401, Biol. of Plants	4
*Basic agriculture	3	P.E., Band, or ROTC	1
P.E., Band, or ROTC	1		18
	18		

SECOND YEAR

Fall		*Spring*	
ENGL 2309 or 3365, Tech. Writing	3	POLS 2301, Amer. Govt., Org.	3
PSS 2311, Veg. Crops	3	AECO 2306, Prin. Mkt. Ag. Prod.	3
HIST 2301, Hist. of U.S. since 1877	3	PSS 2432, Prin. Pract. Soils	4
ENTO 2201, Intro. Ento.	2	PSS 2313, Herb. Plants or PSS 2314 or PSS 4313	3
ENTO 2101, Intro. Ento. Lab.	1	CHEM 3401, Org. Chem.	4
PSS 2312, Propagation Meth.	3		17
Elective	3		
	18		

THIRD YEAR

Fall		*Spring*	
BOT 3302, Plant Path.	3	MCAG 3302, Irr. & Eros. Contr.	3
PSS 3311, Tree Fruit Cul.	3	PSS 4333, Soil Chem. or PSS 4335	3
BOT 3401, Plant Physiol.	4	PSS 4131, Soil Fert. Lab.	1
PSS 3421, Genetics	4	PSS 4323, Weed Control	3
MBIO 3400, Microbiology	4	POLS 2302, Amer. Pub. Pol.	3
	18	Elective	3
			16

FOURTH YEAR

Fall		*Spring*	
PSS 4100, Seminar	1	ENTO 4301, Ag. Compounds	3
PSS 4311, Adv. Fruit Prod. or PSS 4312	3	Elective	12
Elective	10		15
	14		

*See Courses for Freshman Year.

Horticulture Curriculum, Nursery Management Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
PSS 1311, Prin. of Hort. or PSS 1312	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1305, Ess. Chem. I	3	BIOL 1401, Biol. of Plants	4
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	CHEM 1306, Ess. Chem. II	3
MATH 1320, Coll. Algebra or MATH 1330	3	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
ENGL 1301, Ess. Coll. Rhetoric	3	ACCT 2303, Using Acct. Info.	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	15		18

SECOND YEAR

Fall		*Spring*	
SCOM 1301, Interpers. Comm. or ENGL 2309 or 3365	3	HIST 2301, Hist. of U.S. since 1877	3
HIST 2300, Hist. of U.S. to 1877	3	ENTO 2201, Intro. Ento.	2
POLS 2301, Amer. Govt., Org.	3	ENTO 2101, Intro. Ento. Lab.	1
PSS 2313, Herb. Plant Matl.	3	MCAG 2202, Ag. Surv. & Land Conserv.	2
PSS 2312, Propagation Meth.	3	PSS 2432, Prin. & Pract. Soils	4
	15	PSS 2314, Woody Plants	3
		POLS 2302, Amer. Pub. Pol.	3
			18

THIRD YEAR

Fall		*Spring*	
MKT 3350, Intro. to Mkt. or AECO 2306	3	ENTO 3203, Hort. Pests	2
AECO 3302, Ag. Finance	3	MGT 3370, Org. & Mgt.	3
PSS 3313, Turfgrass Mgt.	3	PSS 3314, Nurs. Matls. Usage	3
BLAW 3391, Bus. Law or BLAW 3393	3	PSS 3317, Interior Plants	3
PALA 3304, Landscape Constr.	3	PSS 3315, Grounds Maint. & Oper.	3
Elective	3	Elective	2
	18		16

FOURTH YEAR

Fall		*Spring*	
PSS 4100, Seminar	1	ENTO 4301, Ag. Compounds	3
PSS 3316, Garden Cent. & Nurs. Mgt.	3	PSS 4313, Arboriculture	3
MKT 4351, Retail Mgt. or MGT 4370	3	PSS 4323, Weed Control	3
PSS 3311, Tree Fruit Culture or PSS 3312, Prin. of Flor.	3	BOT 3302, Plant Path. or BOT 3401	3-4
Elective	6	Elective	5-6
	16		18

Horticulture Curriculum, Horticulture Therapy Specialization.

FIRST YEAR

Fall		*Spring*	
CHEM 1305, Ess. Chem. I	3	CHEM 1306, Ess. Chem. II	3
CHEM 1101, Exp. Ess. Chem. I (Lab.)	1	CHEM 1102, Exp. Ess. Chem. II (Lab.)	1
PSS 1311, Prin. of Hort. or PSS 1312	3	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	BIOL 1401, Biol. of Plants	4
MATH 1320, Coll. Algebra or MATH 1330	3	PSY 1300, Gen. Psychology	3
*Basic agriculture	3	SOC 2301, Intro. Sociology	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	17		18

SECOND YEAR

Fall		*Spring*	
SOC 2320, Current Soc. Prob.	3	PSS 2432, Prin. Pract. Soils	4
PSS 2313, Herb. Plant Matl.	3	PSS 2312, Propagation Meth.	3
PSS 2311, Veg. Crops	3	PSS 2314, Woody Plant Matl.	3
HIST 2300, Hist. of U.S. to 1877	3	ENTO 2201, Intro. Ento.	2
POLS 2301, Amer. Govt., Org.	3	ENTO 2101, Intro. Ento. Lab.	1
Elective	3	HIST 2301, Hist. of U.S. since 1877	3
	18		16

THIRD YEAR

Fall		*Spring*	
POLS 2302, Amer. Pub. Pol.	3	BOT 3401, Plant Physiology	4
PSS 3313, Turfgrass Mgt.	3	PSS 3421, Genetics	4
SOC 3324, 3334, 4325, or 4362	3	AGSC 3300, Internship	3
BOT 3302, Plant Pathology	3	F R 2322, 3332, or C D 3306	3
PSS 3317, Interior Plants	3	Elective	2
F R 3320, Contemporary Family or F R 3326	3		16
	18		

FOURTH YEAR

Fall		*Spring*	
PSS 3312, Prin. of Flor.	3	EDSP 3300, 4320, 4321, 4322 (choose two)	6
PSY 3304, Intro. Soc. Psych.	3	PSS 4313, Arboriculture	3
PSY 4305, Abnormal Psych. or PSY 3306	3	Elective	6
PSS 4100, Seminar	1		15
Elective	6		
	16		

*See Courses for Freshman Year.

Horticulture Curriculum, Ornamental Specialization.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, The Ag. Industry	1	AECO 1301, Intro. Ag. Eco.	3
PSS 1311, Prin. of Hort. or		BIOL 1401, Biol. of Plants	4
PSS 1312	3	CHEM 1306, Ess. Chem. II	3
CHEM 1305, Ess. Chem. I	3	CHEM 1102, Gen. Chem. II (Lab.)	1
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1320, Coll. Algebra or		*Basic agriculture	3
MATH 1330	3	P.E., Band, or ROTC	1
ENGL 1301, Ess. Coll. Rhetoric	3		—
*Basic agriculture	3		18
P.E., Band, or ROTC	1		
	—		
	18		

SECOND YEAR

Fall		*Spring*	
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
PALA 1301, Fund. Park Planning	3	PSS 2314, Woody Plant Matl.	3
PSS 2313, Herb. Plant Matl.	3	PSS 2312, Propagation Meth.	3
ENGL 2309 or 3365, Tech. Writing	3	PSS 2432, Prin. & Pract. Soils	4
ENTO 2201, Intro. Ento.	2	POLS 2301, Amer. Govt., Org.	3
ENTO 2101, Intro. Ento. Lab.	1		—
Elective	3		16
	—		
	18		

THIRD YEAR

Fall		*Spring*	
POLS 2302, Amer. Pub. Pol.	3	PSS 2311, Veg. Crops or	
MBIO 3400, Microbiology	4	PSS 3311	3
BOT 3401, Plant Physiology	4	BOT 3304, Plant Taxonomy	3
BOT 3302, Plant Pathology	3	PSS 3421, Genetics	4
PSS 3313, Turfgrass Mgt.	3	PSS 3314, Nurs. Matls. Usage	3
	—	Elective	3
	17		—
			16

FOURTH YEAR

Fall		*Spring*	
PSS 3312, Prin. Floriculture	3	ENTO 4301, Ag. Compounds	3
PSS 3317, Interior Plants	3	PSS 4313, Arboriculture	3
PSS 4100, Seminar	1	PSS 3315, Grounds Maint. & Oper.	3
PSS 4323, Weed Control or		Elective	8
PSS 4335 and	3		—
PSS 4131	1		17
Elective	3		
	—		
	14		

*See Courses for Freshman Year.

Courses in Plant and Soil Science. (PSS)

1311. Principles of Horticulture (3:2:2). Fundamental principles and practices of growth, maintenance, and use of horticultural plants, and landscape of small homes.

1312. Fundamentals of Horticulture (3:3:0). Fundamental principles and practices of growth, maintenance, and use of horticultural plants in a home landscape environment.

1321. **Agronomic Plant Science (3:3:0).** Importance, distribution, and use of major world agronomic crops. Fundamentals of growth, structure, and improvement are also stressed.

2231. **Introductory Urban Soils (2:2:0).** Development and utilization of nonagricultural soils with emphasis on physical properties for urban uses. (Credit not given for both PSS 2331 and 2431 or 2432).

2311. **Vegetable Crops (3:2:3).** Principles and practices in home gardening, with an introduction to the production of the major truck crops.

2312. **Propagation Methods (3:3:0).** Prerequisite: PSS 1311 or 1312. Propagation techniques of commercial nurseries and greenhouse ranges; study of the physiological reaction and cutting material.

2313. **Herbaceous Plant Materials (3:2:2).** Prerequisite: PSS 1311 or 1312. Study of the principal herbaceous plants and plant families, palms, roses, and subtropic landscape plants.

2314. **Woody Plants (3:2:2).** Prerequisite: PSS 1311 or 1312. Discussion and selection of woody plants used for ornamental purposes in the landscape setting. The course will be divided between deciduous and evergreen plants.

2321. **Crop Growth and Culture (3:3:0).** Study of the growth and development sequences of crop plants as related to production. Emphasis will be placed on anatomical, morphological, and physiological characteristics.

2322. **Market Quality and Crop Identification (3:1:4).** Analysis of seed quality for marketing. Identification and classification of crops and diseases. Study of federal grain grading standards.

2431. **Soils (4:3:2).** Prerequisite: CHEM 1307, 1101 or 1305, 1101. Formation and classification; physical, chemical, and biological properties; physical and chemical analysis and mapping of designated areas in laboratory. (Credit not given for both PSS 2431 and 2432).

2432. **Principles and Practices in Soils (4:3:2).** Prerequisite: CHEM 1307, 1101 or 1305, 1101. Development and management of agricultural soils. Emphasis upon properties affecting water and fertility relationships; useful to professional agriculturalists, farm-ranch managers. Not open to majors in soil science and crop science. (Credit not given for both PSS 2431 and 2432).

3311. **Tree Fruit Culture (3:3:0).** Principles of fruit culture with emphasis on variety selection, pruning techniques, and propagation methods.

3312. **Principles of Floriculture (3:2:3).** Greenhouse construction, heating, fundamental soil treatment, and the basic principles of flower production and floriculture marketing. Required field trips.

3313. **Turfgrass Management (3:3:0).** Principles and practices of turfgrass management for such specialized areas as athletic fields, playground areas, golf courses, home lawns, etc.

3314. **Nursery Materials Usage for the Home (3:2:2).** Prerequisite: PSS 1311 or 1312. Aimed at providing sufficient background for the student to plan and analyze the home plantings and to design suitable solutions for this problem.

3315. **Grounds Maintenance and Operations (3:2:2).** Maintenance and management practices involving plant care, erosion control, and landscape construction implementation methods.

3316. **Garden Center and Nursery Management (3:2:3).** The principles of management, structure, distribution, and sales for both retail and wholesale establishments. Field trips required.

3317. **Interior Plants (3:2:3).** Selection and maintenance of interior plants and planting facilities.

3318. **Viticulture and Small Fruits (3:2:2).** Botany, propagation, culture, harvesting, and marketing of grapes, strawberries, blueberries, cranberries, bramble fruits, currants, and gooseberries.

3321. Forage and Pasture Crops (3:3:0). The production and use of forage and pasture crops.

3322. Grain Crops (3:3:0). Prerequisite: PSS 1321. The production, improvement, storage, and use of grain crops.

3323. Crop Ecology (3:3:0). Prerequisite: PSS 1321. The effect of edaphic, climatic, and environmental factors on crop adaptation and production.

3324. Seed Quality and Technology (3:2:3). Analysis of seed for planting. Seed quality as related to production, processing, storing, and handling. Study of federal and state seed laws.

3421. Fundamental Principles of Genetics (4:4:0). Prerequisite: PSS 1321 or BIOL 1401 or consent of instructor. Heredity and variation. The chromosome theory in plants and animals. Biometry as applied to genetic data.

4100. Seminar (1:1:0). Prerequisite: Senior standing or approval of instructor. Assigned readings, current advances. Informal discussions, oral reports, and papers. May be repeated.

4101. Problems (1:1:0). Prerequisite: Approval of instructor. An assigned problem and individual instruction. May be repeated for credit with approval of department chairperson.

4121. Weed Control Lab (1:0:3). Prerequisite: PSS 4323 or concurrent enrollment in PSS 4323. Emphasis on important weeds in Texas, their identification and methods of control, including herbicide selection, equipment used, calculations, and calibrations.

4122. Crop Physiology Laboratory (1:0:2). Corequisite: PSS 4324. Experimental laboratory demonstrating physiological processes in whole plant development.

4131. Soil Fertility Laboratory (1:0:3). Prerequisite: PSS 2431 or 2432, concurrent enrollment in PSS 4335. Laboratory analysis of soil and plant samples and the interpretation of results in relation to a fertility management program.

4311. Advanced Fruit Production (3:3:0). Prerequsite: PSS 3311 or consent of instructor. Principles and practices in the commercial production, storage, and handling of the important field crops. Required field trips.

4312. Commercial Vegetable Production (3:3:0). Prerequisite: PSS 2311 or consent of instructor. Principles and practices in the commercial production and handling of important vegetable crops. Required field trips.

4313. Arboriculture (3:3:0). Prerequisite: PSS 1311. The physiological principles and industry practices in the production, moving, care, and maintenance of ornamental trees, shrubs, and ground covers. Required field trips.

4321. Fundamental Principles of Plant Breeding (3:3:0). Prerequisite: PSS 3421. Practical application of genetics in the breeding and improvement of plants.

4322. Advanced Crop Management (3:3:0). Prerequisite: PSS 1321, 2431 (or 2432). Study of interrelated factors (weeds, insects, diseases, seed quality, fertility, water, etc.) affecting decisions for maximizing crop production and economic returns.

4323. Weed Control (3:3:0). Prerequisite: Junior standing in agriculture. The importance, distribution, reproduction, and dissemination of weeds. Mechanical, biological, and chemical methods of control.

4324. Agricultural Plant Physiology (3:3:0). Prerequisite: CHEM 3401; BOT 3401 or CHEM 3402 recommended, or approval of instructor. Physiological considerations during germination, growth, flowering, and fruit production. Emphasis on environmental conditions and influences on all metabolic processes.

4331. Soil and Water Conservation (3:2:3). Prerequisite: PSS 2431 or 2432. Factors affecting wind and water erosion; soil and water conservation practices; planning for optimum land use.

4332. Soil Classification (3:2:3). Prerequisite: PSS 2431, 2432, or approval of instructor for nonagriculture majors. Soil profile morphology. Classification systems with emphasis on the taxonomic system of the United States.

4333. Soil Chemistry (3:2:3). Prerequisite: PSS 2431 or 2432, 12 hours of chemistry or approval of instructor for nonagriculture majors. Chemical composition of soils with emphasis on clays. Ion exchange phenomena; chemical equilibria; clay-organic reactions.

4334. Soil Microbiology (3:2:3). Prerequisite: Junior standing and instructor's approval. Soil microorganisms: their occurrence, characteristics, and functions in the decomposition of organic matter and soil fertility.

4335. Soil Fertility Management (3:3:0). Prerequisite: PSS 2431 or 2432. Nutrient availability as influenced by the properties of soils, soil amendments, fertilizers, and crop rotation in a fertility function of nutrient elements.

4336. Soil Physical Properties (3:2:3). Prerequisite: PSS 2431 or 2432, 6 hours of physics and mathematics, or approval of instructor. Physical properties of soils: structure, water, air, and temperature.

Department of Range and Wildlife Management

Horn Professor Henry Wright, Chairperson.
Hom Professor Bolen; Professors Dahl and Sosebee; Associate Professors Britton, Bryant, Guthery, Hunter, and Pettit; Assistant Professors Murphy and Warren; Adjunct Professor Drawe.

This department supervises the following degree programs: *Bachelor of Science* in RANGE MANAGEMENT, *Bachelor of Science* in WILDLIFE MANAGEMENT, *Bachelor of Science, Master of Science* in RANGE SCIENCE, *Master of Science* in WILDLIFE SCIENCE, and *Doctor of Philosophy* in AGRICULTURE with options in Range Science, Range and Wildlife Science, and Wildlife Science.

The Department of Range and Wildlife Management is primarily concerned with the application of basic ecological principles to the management and use of natural resources. The range science specialization prepares students for graduate school and meets the Civil Service requirements for positions as range conservationists for agencies such as the Soil Conservation Service, Forest Service, and Bureau of Land Management. The wildlife management curriculum prepares students for graduate school and meets the minimum requirements recommended by the Wildlife Society for wildlife biologist certification. Students may also simultaneously fulfill the requirements for a second B.S. degree in the department by completing an additional 24 to 32 hours of course work.

The minimum grade-point average (GPA) requirement for freshmen and sophomores in the department is the same as that for the University. In cases where minimum standards are not met, students will be placed on departmental scholastic probation. Students may be removed from such probation in the same manner as described under Academic Information for the University. Students will be suspended from the department when they fail to meet the minimum academic requirements outlined above in their next regular semester (fall or spring) of attendance after being on scholastic probation or suspension. Students transferring from other departments of the University will be admitted to this department on the same basis as above.

Range Management Curriculum.

Basic Curriculum	Specialization: Range Science	Specialization: Range and Wildlife Habitat*
FIRST YEAR		
AGSC 1111, The Ag. Industry ENGL 1301 & 1302, Coll. Rhet. BIOL 1401 & 1402, Biol. of Plants & Biol. of Animals R&WM 2301, Intro. Wildlife MATH 1330, Intro. Math. Anal. or MATH 1350 CHEM 1305, Ess. Chem. I CHEM 1101, Exp. Gen. Chem. I (Lab.) P.E., Band, or ROTC	MATH 1331, Intro. Math. Anal. or MATH 1351 Elective (2 hrs.)	MATH 1331, Intro. Math. Anal. or MATH 1351 R&WM 2302, Ecol. Cons. Nat. Res.
SECOND YEAR		
R&WM 3101, Range Plant Ident. R&WM 3301, Range Plants CHEM 1306, Ess. Chem. II CHEM 1102, Exp. Gen. Chem. II (Lab.) AECO 1301, Intro. Ag. Eco. or AECO 2305 PSS 3421, Genetics or BIOL 3301 ENGL 3365, Tech. Writing	BOT 3304, Taxonomy CHEM 3401, Intro. Org. Chem. PSS 2432, Soils R&WM 2302, Ecol. & Cons. Nat. Res. Elective (3 hrs.)	CHEM 3401, Intro. Org. Chem. BOT 3304, Plant Taxonomy BOT 3401, Plant Phys. or PSS 4324 PSS 2432, Soils PSS 3321, For. & Past. Crops
THIRD YEAR		
ANSC 3301, Prin. Animal Nutr. **POLS 2301, Amer. Govt., Org. **HIST 2300, Hist. of U.S. to 1877 R&WM 3201, Veg. Anal. & Tech. R&WM 3302, Range Plant Ecol. R&WM 3304, Prin. Range Mgt. SCOM 3308, Bus. & Prof. Speech **POLS 2302, Amer. Pub. Pol. **HIST 2301, Hist. of U.S. since 1877	BOT 3401, Plant Physiol. Elective (4 hrs.)	ZOOL 4306, Intro. Mam. PALA 4308, Intro. Orn. PALA 4304, Watershed Mgt.
FOURTH YEAR		
ANSC 3302, Livestock Prod. or ANSC 4306 or ANSC 4308	R&WM 4302, Range Impr. R&WM 4303, Range Anal. Plan. R&WM 4304, Fire Ecol. & Mgt. AECO 3312, Range and Ranch. Eco. AECO 3401, Ag. Stat. PSS 3321, For. & Past. Crops PSS 4332, Soil Clas. AG E 2401, Plane & Topo. Surv. PALA 4304, Watershed Mgt. or AG E 4401 Elective (3 hrs.)	R&WM 4302, Range Imp. R&WM 4303, Range Anal. & Plan. R&WM 4304, Fire Ecol. BIOL 4309 or R&WM 4401 R&WM 4307 or 4308 AECO 3304 or 3312 AECO 3401, Ag. Stat. R&WM 4309, Range & Wildl. Hab. Mgt. PSS 4332, Soil Clas. †Range & Wildl. (3 hrs.)

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132 (Range Science) and 134 (Range and Wildlife Habitat).
*Meets minimum standards for certification by the Wildlife Society.
**Student may select an alternative history or political science course.
†Select from R&WM 4305, 4306, 4310, 4311.

Wildlife Management Curriculum.

FIRST YEAR

Fall		*Spring*	
AGSC 1111, Ag. Industry	1	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	BIOL 1402, Biol. of Animals	4
BIOL 1401, Biol. of Plants	4	CHEM 1306, Ess. Chem. II	3
CHEM 1305, Ess. Chem. I	3	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	MATH 1331, Intro. Math. Anal. or MATH 1351	3
MATH 1330, Intro. Math. Anal. or MATH 1350	3	R&WM 2302, Ecol. & Cons. Nat. Res.	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	16		18

SECOND YEAR

Fall		*Spring*	
R&WM 2301, Intro. Wildlife	3	PALA 1301, Intro. Park Mgt.	3
R&WM 3301, Range Plants	3	CHEM 3401, Intro. Org. Chem.	4
R&WM 3101, Range Plant Ident.	1	SCOM 3308, Bus. & Prof. Speech or JOUR 3310	3
PSS 3421, Fund. Prin. Gen. or BIOL 3301	3-4	POLS 2302, Am. Pub. Pol.	3
POLS 2301, Am. Govt., Org.	3	AECO 1301, Intro. Ag. Eco. or AECO 2305	3
ZOOL 2405, Vert. Struct. & Dev.	4		
	17-18		16

THIRD YEAR

Fall		*Spring*	
R&WM 3302, Range Plant Ecol.	3	R&WM 3304, Prin. Range Mgt.	3
R&WM 3201, Veg. Invent. & Anal.	2	HIST 2301, Hist. of U.S. since 1877	3
BOT 3401, Plant Physiology	4	ZOOL 4308, Ornithology	3
HIST 2300, Hist. of U.S. to 1877	3	Elective	7-8
ZOOL 4306, Intro. Mammalogy	3		
PSS 2431, Soils	4		16-17
	19		

FOURTH YEAR

Fall		*Spring*	
R&WM 4307, Wild. Inv. Tech.	3	R&WM 4303, Range Anal. & Plan. or PALA 4302 or PALA 4303 or PALA 4304	3
R&WM 4309, Wild. Habitat Mgt.	3	R&WM 4308, Wild. Pop. Dyn.	3
Elective	10	AECO 3401, Ag. Statistics	4
	16	ENGL 3365, Tech. Writing	3
		Elective	2
			15

Hours required for graduation, exclusive of P.E., Band, or ROTC — 132.

Courses in Range and Wildlife Management. (R&WM)

2301. Introductory Wildlife (3:3:0). Introduction to the ecology and management of wildlife populations. Stresses principles, life histories, and management techniques.

2302. The Ecology and Conservation of Natural Resources (3:3:0). An introduction to the conservation of renewable natural resources of native lands, including their multiple use for timber, water, range, recreation, and wildlife.

2303. Introduction to Fisheries (3:3:0). Fisheries science with an emphasis on basic principles underlying management of aquatic renewable natural resources. Includes biological, ecological, historical, and sociological characteristics of fisheries.

3101. Range Plant Identification (1:0:3). Prerequisite: Concurrent enrollment in R&WM 3301. An opportunity to develop plant identification skills of range and wildlife management students.

3201. Vegetation Inventory and Analysis (2:1:2). Prerequisite: Concurrent registration in R&WM 3302. Techniques and methods for sampling and analyzing rangeland vegetation.

3301. Range Plants (3:3:0). Prerequisite: Concurrent enrollment in R&WM 3101 and sophomore standing. A study of the native and introduced forage plants of the U.S.; their identification, distribution, ecology, and economic value are stressed.

3302. Range Plant Ecology (3:3:0). The basic principles of autecology and synecology and their relationship to management of the range ecosystem.

3303. Range Management Principles and Practices (3:3:0). Prerequisite: Sophomore standing. A general course in the principles and practices of range management designed for nonrange majors who plan to enter the ranching industry. Field trips required. Not open to range majors.

3304. Principles of Range Management (3:2:3). Prerequisite: R&WM 3101 and 3301. Application of ecological principles in the management of rangelands for sustained livestock products consistent with conservation of the range resource. Field trips required.

3390. Fisheries Ecology (3:3:0). Prerequisite: R&WM 2303 or consent of instructor. Interactions of fish with their environment, with emphasis on adaptation at the organism, population, and community level.

4100. Seminar (1:1:0). Prerequisite: Senior standing. An organized discussion of current problems and research in range management. May be repeated.

4301. Problems (3). Prerequisite: Approval of instructor. Individual investigation of an assigned problem in range or wildlife management. Emphasis placed on the theory, methods, and practice of range or wildlife field work.

4302. Range Improvements (3:2:3). Prerequisite: Consent of instructor. Application of principles and practices necessary to enhance the productive potential of the range resource for all potential uses. Methods for brush management, revegetation, conservation etc. are considered. Improvement for increased domestic livestock production and for enhancing wildlife habitat is emphasized. Field trips required.

4303. Rangeland Analysis and Management Planning (3:2:3). Prerequisite: R&WM 3304 or 4302 or consent of the instructor. Analysis of rangeland resource inventories for the purpose of planning appropriate use of such resources. A familiarization with the basic components of a range resource plan and their application in decision making.

4304. Fire Ecology and Management (3:3:0). Prerequisite: R&WM 3101 and 3301, general plant ecology, or consent of instructor. The effect of fire on major vegetation zones in North America and ecological changes of plants and animals. Physical effects of fires on soils and plants, management applications, and prescribed burning techniques.

4305. Big Game Ecology (3:2:3). Prerequisite: BIOL 1402, R&WM 2301, 3 hours of range management. Survey of distributions and life histories of North American big game species. Productivity, food habits, economic significance and management will be examined. Field trips required.

4306. Upland Game Ecology (3:2:3). Prerequisite: R&WM 2301 or consent of instructor. Ecological approach to the management of upland game populations. Stresses population mechanisms and habitat management of selected species. Field trips required.

4307. Wildlife Investigational Techniques (3:3:3). Prerequisite: Junior standing in biological sciences. The basic methodology of practical wildlife management. This involves the routine techniques in data collection related to population maintenance, as well as ways to monitor field research.

4308. Wildlife Population Dynamics and Analysis (3:3:0). Prerequisite: R&WM 2301, MATH 1331, or consent of instructor. The mechanisms of wildlife population changes and their management. Detailed examination of techniques for measuring population characteristics.

4309. Range-Wildlife Habitat Management (3:3:0). Prerequisite: R&WM 2301, 3304, or consent of instructor. A study of wildlife habitats based on major vegetation types and the management problems involved. Emphasis on how other resource demands can be integrated with wildlife. Field trips required.

4310. Principles of Waterfowl Management (3:2:3). Prerequisite: R&WM 2301, BOT 3304, or consent of instructor. Ecology and management of continental waterfowl resources. Life histories, population management, and habitat manipulation are stressed. Field trips required.

4311. Wildlife Behavior (3:3:0). Prerequisite: Junior standing, 6 hours of wildlife or zoology or consent of instructor. Introduction to the concepts of animal behavior as they relate to wildlife populations, ecology and management.

4312. Wildlife Diseases (3:3:0). Prerequisite: Senior standing in Wildlife Management or consent of instructor. A survey of principal diseases and disease agents of wildlife species and populations. Emphasis is given to recognition and management.

4313. Rehabilitation of Disturbed Lands (3:3:0). Prerequisite: R&WM 4302. Characterization of problems associated with lands disturbed by surface mining and oil explorations, laws governing rehabilitation procedures, rehabilitation potential, and methods of rehabilitating disturbed lands.

4401. Fisheries Management (4:3:3). Theory and practice of fisheries management with emphasis on basic strategies used in effective management of aquatic renewable natural resources. Applied field problems, equipment use.

College of Arts and Sciences

Professor William B. Conroy, *Dean*

The College of Arts and Sciences offers a broad spectrum of programs and courses in the arts, humanities, mathematics, and social, behavioral, and natural sciences. The primary function of the college is to impart to students the knowledge, the skills of thinking and communicating, and the values and attitudes which constitute a liberal education. The faculty of the college seek to instill in their students a humanistic spirit, an appreciation of creativity, a commitment to excellence and truth, an ability to think critically and to communicate effectively, and a desire for lifelong learning.

The courses and programs in Arts and Sciences also provide a base of knowledge and skills from which students may enter such professional fields of study as law and medicine.

The college is divided into instructional departments which offer the courses and supervise the degree programs. In addition to the academic departments, the departments of Biblical Literature, Aerospace Studies, and Military Science are included within the college.

The student should note carefully any particular requirements indicated by the department in which he or she plans to major or minor. For many departmental programs, suggested curricula have been designed and are presented in tables under the appropriate departmental heading. General degree requirements are listed on the following pages. There are also several interdepartmental degree programs which are described in a separate section below. Information regarding graduate programs offered by Arts and Sciences departments is available in the *Graduate Catalog*.

Courses are listed on the following pages by departments. Each course is listed by name and number, and most include brief descriptions. An examination of these course descriptions will reveal that many subjects are covered to meet different interests and purposes. Some courses are open to all students, while others are for the specialist in that area. Students thus have an opportunity to take courses which broaden their educational experience or which provide concentration in a particular subject. The wise student will include courses of both kinds.

Course Load. The amount of work normally carried by a student in the College of Arts and Sciences should not exceed 17 hours per semester. In calculating the load, the dean will consider all active correspondence courses as a part of the course load. Course loads in excess of 20 semester hours will not be approved except in unusual circumstances for outstanding students. The normal course load for a single summer session is 7 hours. A graduating senior may petition to take 9 hours one session or a maximum of 15 hours both sessions to meet graduation requirements.

Credit by Examination. A matriculated student may attempt credit by examination (described elsewhere in this catalog) by obtaining written approval from the academic dean's office. To be eligible for course credit by examination, a student must have not enrolled for credit in the course, have completed a higher level course in that subject, nor have previously attempted credit by examination in the course. Credit by examination must be earned in freshman and sophomore

courses and in General Degree Requirements before a student attains junior classification.

Grades of D. Credits for a course in which a grade of D is earned may not be applied toward fulfillment of the major, minor, or teaching field requirements for any degree program.

Grading Practices. The College of Arts and Sciences conforms to University grading practices as set forth in the major section entitled "Academic Regulations" in this catalog. In addition, the following regulations apply within the college.

The symbol X used by the computer when a grade of record (A, B, C, D, F, I) is not reported will be changed to a grade of F at the end of the next regular semester.

Except for those courses designated "may be repeated for credit" in this catalog, no course may be repeated more than once without approval of the dean of the college. Both grades will be used for computing the cumulative grade-point average for graduation purposes.

Any change of grade deemed appropriate (except for a grade of I) must be made by the end of the next regular semester after the original grade is assigned.

Second Bachelor's Degree. No second bachelor's degree is conferred until the candidate has completed at least 24 semester hours in residence in addition to the courses counted toward the first bachelor's degree. Credit by examination will not satisfy the 24-hour residence requirement. The second baccalaureate degree must be a different degree from the first awarded.

Freshman Year. Entering freshmen develop their programs in conference with an academic advisor, to whom they are assigned for their first year in college. The students report to their advisors for such individual conferences of group meetings as are needed for the purpose of orienting themselves to academic regulations and procedures, curricula, and degree requirements in their various areas of interest.

Students are urged to take required freshman courses during the freshman year. During the sophomore year the student should complete the second year of English and all other freshman requirements.

Every student should file a degree plan upon completing 64 semester hours.

General Degree Requirements

Requirements for the degree of Bachelor of Arts also apply to all other degrees offered through the College of Arts and Sciences unless specifically shown to the contrary.

Bachelor of Arts. The curriculum established for this degree is designed to provide the foundation of a liberal education through a well-rounded study of the humanities, mathematics, and the physical, biological, and social sciences. It also provides the factual basis and the insights requisite for specialized study and professional work in these fields.

Specific Requirements

(See section on Undergraduate Credit by Examination for information on credit provided by test scores for these requirements.)

Semester Hours

1. English 12
   The 12 hours of English must consist of ENGL 1301 and 1302 and two sophomore-level literature courses. CLAS 1310, SCOM 1301, PHIL 2310, or ENGL 2309 may be used to fulfill the final 3 hours of this requirement.
2. Foreign Language 6-14
   A student must complete 6 hours at the sophomore level or above in a single language. If 4 semesters are accepted for admission, the student will normally enroll in the second-year sequence, but may begin in the first-year sequence. A student who enrolls in the first-year sequence will have a 10 to 14 hour requirement. A student who enrolls in the second-year sequence will have a 6 hour requirement. Foreign students whose native language is not English and who graduated from a secondary school in their native country may satisfy this requirement by bringing their certificate of graduation to the Student Division of the Arts and Sciences dean's office. However, foreign students may not receive credit for courses in their native language which are numbered below 4000.
3. Mathematics. 0-6
   If 7 semesters of mathematics including 4 of algebra, 2 of geometry, and 1 of trigonometry are accepted for admission, no further courses in mathematics are required. If 6 semesters are accepted, including 4 of algebra and 2 of geometry, 3 semester hours are required. If these admission requirements are not met, 6 hours of mathematics are required. MATH 2300 may not be taken to satisfy this requirement.
4. American History (HIST 2300 and 2301) 6
   Students will normally enroll in HIST 2300, 2301 although any American history course will satisfy this requirement. Credit by examination for part of this requirement is available, but 3 hours must be taken in residence. Students should consult the History Department.
5. Political Science (POLS 2301 and 2302) 6
   Credit by examination for part of this requirement is available, but 3 hours must be taken in residence. Students should consult the Political Science Department. For more information, see the Political Science section of this catalog.
6. Physical Education 2
   Enrollment in two semesters is required. Band or ROTC may be used to satisfy this requirement.

Distribution Requirements

Students must take the specified number of hours in these areas. Courses from the major and minor may be used to satisfy these requirements, but courses used to fulfill Specific Requirements may not be used to satisfy Distribution Requirements. A course may not be counted in two areas.

Semester Hours

1. Humanities (6 hours from each group) 12
   A. Classical and Romance Languages including Classics, English (except technical writing), Germanic and Slavic Languages, Philosophy (except PHIL 3331), Speech Communication (SCOM 2304, 3302, 3306, 4308), A&SH 3301, 3305, HUM 2301, 2302, ANTH 3323, 3325, 3346, 3351, LAAS 2300, 4300, HIST 1300, 1301, SOC 4331.
   B. Art, Music Literature, TH A 2301, 2303, 2304, 3308, 3309, DAN 3313, A&SH 3304.
2. Natural Science 8-14
   If 4 or more high school semesters of natural laboratory science (not including general, physical, or applied science) are accepted for admission, the requirement is 8 hours; if not, the requirement is 14 hours. The first 8 hours of a student's requirement must come from laboratory courses in the following areas: ANTH 2400, atmospheric science, biology, chemistry, geology, physical geography, physics. Any additional required hours must come from the above areas or from ASTR 2300, 2301, ANTH 3310, 3311, 4341, 4601, 4642, A&SH 3302.
3. Social/Behavioral Sciences 6
   †anthropology, economics, †geography, HLED 1303, †history, PHIL 3331, political science, psychology, sociology, *MCOM 1300, 4320, 4380, 4390, JOUR 3350, 4330, A&SH 3303, LAAS 2300, 4300, SCOM 2303, 2306, 3300, 4302, P E 2302.

†Excluding any course in this subject cited as an option in the Natural Science or Humanities requirement.
*Mass communications majors may not use these courses to satisfy this requirement.

Major, Minor, and Electives

In addition to the above requirements, the student must take major, minor, and elective courses sufficient to total 125 semester hours.

The minor may be any departmental minor, an established interdisciplinary minor, or a student-initiated interdisciplinary minor (with the approval of the Dean of the College of Arts and Sciences). No more than 9 semester hours used to satisfy Specific and Distribution Requirements may be used to fulfill the minor.

Students should have selected their major and minor fields by the time they reach their junior year. In the majority of cases students completing requirements for the degree of Bachelor of Arts will carry the major in the departments of this college. For the major subject they will be required to complete a minimum of 30 semester hours, although as indicated in the degree programs on the following pages, some majors require more than the minimum. Eighteen hours of the major subject must be in courses of junior and senior rank. For the minor, a minimum of 18 semester hours must be completed (except in foreign languages — explained under the department concerned), at least 6 of which must be of junior or senior rank. All courses in the major and minor subjects must be approved by the appropriate department. Students are expected to develop a degree plan during the first semester of the junior year. Forms and information are available in the department office.

For the Bachelor of Arts degree, a minimum of 40 semester hours of junior and senior work must be presented; not more than 42 semester hours in one subject may be counted; not more than 12 hours in Biblical literature may be counted; not more than 8 hours may be counted in applied music and/or music ensemble, except for students offering music as a major or minor; not more than 6 hours of P.E. activity courses may be counted as electives; not more than 24 hours in the technical or professional subjects of agriculture, business administration, education, engineering, and/or home economics may be counted as electives; (and not more than 6 hours additional if the minor is taken outside Arts and Sciences); and courses in shorthand and typewriting may not be offered for this degree except in the bilingual secretarial major and the minor in secretarial administration. Also, orientation courses offered by other colleges may not be offered for any degree in Arts and Sciences.

Bachelor of General Studies. The Bachelor of General Studies degree is offered and administered by the College of Arts and Sciences.

This degree program permits students to develop a plan of study with a theme that suits their individual interests and particular needs. It enables the student to use both intercollege and interdepartmental combinations of courses that will provide either a specialized or a broad pattern of educational experience. Plans of study which follow a single department or an established interdisciplinary major are excluded from the general studies program. Though this degree program is not designed as a vocational or preprofessional program, students may prepare themselves for graduate study in a specific subject or for teaching on the secondary level by meeting teacher certification requirements.

The general studies program is supervised by the Director of General Studies and an advisory committee composed of four faculty and two student members who approve all proposed plans of study, review each student's progress, and recommend degree candidates for certification to the Dean of the College of Arts and Sciences. Students may withdraw from the program by presenting a letter of notification and by taking appropriate action to enter a program leading to another degree. Additional information may be obtained from Dr. Charles N. Kellogg, Director, Bachelor of General Studies Program, College of Arts and Sciences. Any exception to the degree requirements must be approved by the director and advisory committee.

Admission Requirements

1. Completion of G ST 1300 — preparation of individual plan of study for the Bachelor of General Studies.
2. Completion of less than 64 semester hours (a student may, however, be admitted to the program during the junior year with committee approval).
3. Approval by the director and advisory committee of the student's proposed plan of study.

Retention Requirements

1. Satisfactory progress toward completion of the proposed plan of study as determined by the advisory committee through periodic reviews.
2. Maintenance of a 2.00 grade-point average each semester in all courses in the approved plan of study.

Degree Requirements Semester Hours

1. English 6-9
2. Required Political Science and History 12
3. Physical Education, Band, or ROTC 2
4. G ST 1300 3
   An individual studies course designed to assist the student in developing a plan of study leading to the Bachelor of General Studies degree.
5. G ST 4300 3-6
   An individual studies course in which the student will prepare a thesis or project. The student should enroll in G ST 4300 the first semester of the senior year. The course may be repeated for credit with prior approval of the Director of General Studies.
6. Completion of the above requirements and the approved plan of study (with a minimum grade of C) plus electives to total a minimum of 125 semester hours, including at least 51 hours at the junior-senior level (with a minimum cumulative grade-point average of 2.00). Normally, 90 of the 125 hours will be completed in the College of Arts and Sciences.

Bachelor of Fine Arts. The curriculum leading to the Bachelor of Fine Arts degree provides highly professional programs in theatre arts, design communication, art education, interior design, and studio areas.

The following are the requirements for this degree:

Semester Hours

1. English 12
2. Political Science 6

3. History 6
4. Theatre Arts or Art and Art History* 75-90
5. General Requirement* 18-42
6. Physical Education, Band, or ROTC 2

Total for degree 134-143

*Requirements vary according to different majors.

Bachelor of Science. The B.S. degree permits a greater degree of specialization than that afforded by the B.A. degree. It is currently offered by the following departments: Biological Sciences, Chemistry, Economics, Geosciences, Mathematics, and Physics.

The following are the requirements for this degree:

	Semester Hours
1. English	12
2. Foreign Language	6-14
3. Mathematics	6
4. Required Political Science and History	12
5. Natural Science	8
6. Nonscience, Nonmathematics electives	6
7. Physical Education, Band, or ROTC	2
8. Major (including a minimum of 24 advanced hours)	(minimum) 36
9. Minor (including a minimum of 6 advanced hours)	(minimum) 18

The minor may be any departmental minor, an established interdisciplinary minor, or a student-initiated minor, and must be approved by the major department.

10. Adjunct Requirements . . . . . As required

Requirements determined by the major department to be essential to supplement the major.

Total for degree . . . . . (minimum) 126

Specific curricula are provided for all programs leading to the Bachelor of Science degree, and it is expected that students will follow the suggestions and recommendations contained therein.

Bachelor of Science in International Trade. This degree provides an understanding of international economic and commercial relationships through concentrations of course work in international economics, international politics, international business, and correlated adjunct courses in foreign area studies and/or business. This understanding is important for a variety of careers which involve international aspects.

The following are the requirements for this degree:

	Semester Hours
1. English (including ENGL 2309 or equivalent)	12
2. Foreign Language	6-14
3. MATH 1330 and 1331	6
4. Required Political Science and History	12
5. Physical Education, Band, or ROTC	2
6. ECO 2311, 2312, 3311, 3312, 3330, 3333, 4333, 4334	24

7. Political Science, three of the following: POLS 3361, 3371, 4363, 4364, 4367 9
8. Four of the following: B A 2303, 4328, 4358, 4375, ECO 4331 12
9. Statistics: MATH 2300 or AECO 3401 or B A 2445 3-4
10. Required adjunct studies, approved correlated courses in foreign area studies, and/or business administration 18
11. Elective Courses 13-22
Total for degree . . . . . (minimum) 126

Students should contact the Department of Economics for more information and for academic advisement.

Bachelor of Science in Physical Education.
The following are the requirements for this degree:

Semester Hours

1. English 12
2. Required Political Science and History 12
3. Mathematics 3
4. Psychology 3
5. Speech 3
6. Laboratory Science (varies with major) 12
7. A minor of at least 18 hours including 6 hours of advanced courses is required on this degree. If students wish to complete requirements for a teaching certificate they must take required courses in the College of Education which will count as electives.
8. Physical Education, Band, or ROTC 2
Total for degree 128-130

Bachelor of Science in Speech and Hearing Sciences. Students seeking this degree may pursue one of two courses of study: they may elect a speech and hearing science concentration that does not lead to certification in any professional area or they may apply for the preprofessional program in speech-language pathology, audiology, or education of the hearing impaired. Preprofessional students will be admitted to these programs by a departmental selection committee. Ordinarily, such students will have to show intent to pursue graduate study and maintain at least a 3.0 grade-point average. Clinical practicum courses are limited to students who are admitted to the preprofessional program. Additional information may be obtained from Dr. Earlene Paynter, Chairperson, Department of Speech and Hearing Sciences.

The following are the requirements for this degree:

Semester Hours

1. English (including ENGL 3365 or equivalent) 12
2. Foreign Language 6-14
A student must complete 12 hours of sign language or 6 hours at the sophomore level or above in a single language.
3. Mathematics 6
4. Required Political Science and History 12

5. Natural Science (including ZOOL 2403 or equivalent) 8
6. Major (including a minimum of 24 advanced hours) 39-45
7. Minor (including a minimum of 6 advanced hours) 18
8. Physical Education, Band, or ROTC 2
9. Adjunct Requirements 15
   No more than 9 hours may be taken in any one area: child development, computer science, education, elementary school curriculum, foreign languages, mathematics, physics, psychology, statistics, research design.
10. Elective Courses. 0-9
    Total for degree 125-133

Bachelor of Music Education. The Bachelor of Music Education degree is for the student who expects to teach or direct vocal or instrumental music in the public schools.

Minimum requirements for the degree of Bachelor of Music Education are as follows:

	Semester Hours
1. English	12
2. Required Political Science and History	12
3. Foreign Language	6-8
4. Lab Science (8 hrs.) or Mathematics (6 hrs.)	6-8
5. Academic Electives (excluding music and education)	6
6. Professional Education and Student Teaching	18
7. Applied music, music literature, music education, music theory, music ensemble (band, chorus, orchestra, opera), and free electives, to total a minimum of 130-134 semester hours, not including physical education, band, or ROTC.	
8. Physical Education, Band, or ROTC	2
Total for degree	132-138

Bachelor of Music. Minimum requirements for the degree of Bachelor of Music (Performance) are as follows:

	Semester Hours
1. English	12
2. Required Political Science and History	12
3. Foreign Language	0-22
4. Applied music, music literature, music education, music theory, music ensemble (band, chorus, orchestra, opera theatre), and free electives to total a minimum of 124 to 132 semester hours, depending upon the major, not including physical education, band, or ROTC.	
5. Physical Education, Band, or ROTC	2
Total for degree	126-136

Special and Interdepartmental Programs

Biblical Literature. This is not a degree program but serves to introduce students to that world of literature — the Bible — which has so broadly affected Western culture. Guidance is given in the study of its moral and religious teachings and their relevance to life today. Though recognized for credit by the University, all courses are taught off campus in centers provided by the churches at no expense to the University. Courses are described in the departmental section on the following pages.

Bilingual Secretarial Program. A degree of Bachelor of Arts with a bilingual secretarial major is offered in cooperation with the Secretarial Administration area in the College of Business Administration. The curriculum is arranged by student consultation with the chairperson of the foreign language department of the student's language emphasis.

The degree requirements follow:

(1) Completion of the general requirements for a Bachelor of Arts degree.

(2) Completion of a major (30 semester hours) in French, German, or Spanish and a minor (minimum 18 hours) in an academic subject or in secretarial administration.

(3) Completion of an additional 25 semester hours in courses in business secretarial administration if the minor is not taken in this subject. This will not normally cause the total hours required for a degree to exceed 125 because the usual elective courses may be used for this purpose. For students who have previously attained basic skills in typing and/or shorthand the requirements in secretarial training will be proportionately reduced. Courses in typing and shorthand may be counted as semester hours toward the degree if this program is completed.

Community and Urban Studies. The College of Arts and Sciences offers an interdisciplinary minor in community and urban studies. The program consists of an integrated course of study which provides the student with a conceptual and theoretical foundation for recognizing and approaching urban problems. An opportunity is also provided for observation and analysis of community and urban affairs. The program includes core courses in architecture, economics, geography, history, political science, and sociology and elective courses in architecture, business administration, economics, geography, history, park administration and landscape architecture, political science, sociology and social welfare. Additional information may be obtained from the Director, Dr. Claud Davidson, Department of Geography, Room 215, Holden Hall.

Comparative Literature. The departments of Classical and Romance Languages, English, and Germanic and Slavic Languages offer a minor for the Bachelor of Arts degree and specializations at the master's and doctor's levels. The minor for the B.A. degree consists of 18 hours of courses, of which 6 hours must be on the junior or senior level, and 3 of these hours must be in a 4000-level course. A student may apply 6 hours of sophomore level course work from any of the three departments if such course work is not in the student's major field. Students must include courses from at least two of the three participating departments and must take at least 6 hours from the following courses: C LT 4320, Classical and Romance Literary Masterpieces and the Cinema, ENGL 3331, 4334, 4335, 4336, 4337, RUSN 3301, 3302, CLAS 3350. Individual minor programs are

arranged by the student and the chairperson of the Interdepartmental Committee on Comparative Literature. This minor may not include course work in the student's major field unless such course work is over and above the minimum catalog requirements for the major. Additional information may be obtained from the Director, Dr. Wendell Aycock, Department of English.

Environmental Studies. The college offers an interdisciplinary minor in environmental studies. This minor is nontechnical in nature and is specifically designed for students seeking the Bachelor of Arts degree. Its focus is on the interaction of humans and the natural environment and the consequences of that interaction. The environmental studies minor does not seek to train professional environmentalists, but in combination with existing major programs it will give the student a broad foundation in preparing for more advanced environmental studies programs, professional work in law, regional planning or resource management, various environmental positions in government or business, and teaching. The plan will also provide students with a better understanding of basic ecology and the nature of environmental problems so that they can make more knowledgeable value judgements on environmental issues, a vital concern in the contemporary world. The minor consists of 18 hours of required and elective courses from the departments of Anthropology; Biological Sciences; Economics; Geography; Geosciences; Health, Physical Education, and Recreation; History; Sociology; and Agricultural Economics. Additional information concerning the environmental studies minor may be obtained from the Director, Dr. Otis Templer, Department of Geography.

Ethnic Studies. The college offers an interdisciplinary minor in ethnic studies. The goals of the program are increased student understanding of the nature and development of race relations, stimulation of a greater sense of dignity for minority students, and expanded student knowledge of problem solving in this important area of American life. Students may, if they wish, specialize in Black, Chicano, or Native American studies. All students minoring in ethnic studies must complete 18 hours in five ethnic content courses, plus E ST 4301. Electives in the program include: ANTH 2301, 3325, 3331, 3345, 3346, 3371, 4372, ART 4104, 4310, ECO 3301, 3302, HIST 3324, 3325, 3326, 4324, 4326, 4382, M LT 3304, POLS 4329, RELG 4305, SOC 3321, 3324, 4326, 4362, SPAN 4320, 4322, 4360. Additional information may be obtained from the Director, Dr. Francisco Balderrama, Department of History.

Courses in Ethnic Studies. (E ST)

4301. Issues in Ethnic Studies (3). Prerequisite: 9 hours in approved courses. Individual study of selected topics concerning ethnic studies in the development of American culture. Research and readings selected cooperatively by instructor and student.

Family Life Studies. The colleges of Arts and Sciences, Home Economics, and Education jointly offer an interdisciplinary minor in family life studies. The program involves an integrated course of study and provides the student with a variety of perspectives on the family. The minor consists of 18 hours chosen from a variety of disciplines. No more than 6 hours may be taken from any one department and courses counted toward the major will not count toward the minor. At least 6 hours must be at the junior-senior level.

Courses may be selected from the following (asterisks denote courses wherein only sections pertaining to family life studies qualify for the minor): HIST *2300, *2301, 3322, 3323, 3341, ANTH 4326, F R 3324, 3320, 3322, 3326, 3332, 2322, SOC 3331, 2331, 4349, 4373, 3322, ECO 3301; HLED 2206, 2207, ECEL 2317, FMHC 1370. Additional information about the minor may be obtained from Dr. Brent S. Roper, Department of Sociology.

General Studies. For a description of the general studies degree program, see "Bachelor of General Studies" under General Degree Requirements.

Courses in General Studies. (G ST)

1300. Introduction to General Studies (3). An individual studies course to prepare the student for developing a thematic plan of study leading to the Bachelor of General Studies degree.

4300. Senior Thesis or Project (3). Preparation of a senior thesis or project for the Bachelor of General Studies degree. Student should take the course the first semester of the senior year. May be repeated for credit with the approval of Director of General Studies.

Honors Studies. The College of Arts and Sciences offers a specific program in honors studies for students seeking a special intellectual experience. Small classes and active student participation characterize honors studies. This is not an accelerated program in regard to quantity of material covered, but an in-depth approach to the understanding of ideas and relationships. Stress is placed upon interpretation and analysis of primary source material, rather than upon memorization. Entering freshmen may participate in honors studies if they have either a B average in high school or an 1100 SAT score, a 26 ACT score, or the approval of the Director of Honors Studies. Students other than entering freshmen who have a B average in college work are equally eligible for participation.

A special effort is made to enrich six courses (the Integrated Program) taken by large numbers of honors students: ENGL 2301, 2302; HIST 2300, 2301, and POLS 2301, 2302. The classroom discussions, led by well-qualified, full-time professors, are supplemented by lectures presented by guest faculty members from many different departments. These enriched courses synthesize the art, music, drama, literature, government, and history of various cultures and societies into a unified study of the development of civilization.

Though the honors studies program is administered through the College of Arts and Sciences, students from any college at Texas Tech may participate. An honors student must major in an academic subject and fulfill normal degree requirements. To graduate "In Honors Studies," a student must have at least a 3.00 grade-point average and must complete at least 30 hours of honors courses, including either a 6-hour senior honors project or two Arts and Sciences honors seminars. Honors courses available include special sections of traditional courses, four interdepartmental honors seminars, and individual study under the direction of a faculty member selected by the student. The honors studies program is administered by the Director of Honors Studies, a faculty-student committee, and a student Honors Council. For further information, consult the Director of Honors Studies, Room 266, Holden Hall.

Many honors courses are offered besides those mentioned above. These courses may be used to fulfill requirements in English, fine arts, humanities, language, mathematics, science, and social science.

Courses in Honors Studies. (A&SH)

3300. Individual Honors Research (3). Prerequisite: Junior standing and participation in honors studies. Contents will vary to meet the needs of students. May be repeated once for credit. Independent work under the individual guidance of a staff member, who must be either a member of the graduate faculty or approved by the Director of Honors Program.

3301. Honors Seminar in Humanities (3:3:0). Prerequisite: Junior standing and participation in honors studies. In-depth study of major literary works emphasizing the interrelationships of literature and philosophy.

3302. Honors Seminar in Sciences (3:3:0). Prerequisite: Junior standing and participation in honors studies. A consideration of the developments and applications of modern science as they affect living today, directed toward cultivating sound individual judgements in a technological society.

3303. Honors Seminar in Social Sciences (3:3:0). Prerequisite: Junior standing and participation in honors studies. Study of techniques, principles, and methodology of the social sciences as applied to a central topic to demonstrate the interrelationships of the various disciplines.

3304. Honors Seminar in Fine Arts (3:3:0). Prerequisite: Junior standing and participation in honors studies. Study of history, development, and terminology of the fine arts, emphasizing functional relationships between disciplines in an effort to provide bases for aesthetic evaluation of specific artistic entities.

3305. Science Fiction (3:3:0). Prerequisite: Honors eligibility. May be repeated once for credit. An examination of several representative science fiction short stories and novels from the past to the present, directed toward a critical consideration of man's future.

4300. Individual Honors Research (3). Prerequisite: Senior standing and participation in honors studies. Contents will vary to meet the needs of students. May be repeated once for credit. Independent work under the individual guidance of a staff member, who must be either a member of the graduate faculty or approved by the Director of Honors Program.

Humanities. Humanities includes all disciplines that explore man's creative expressions — literature, music, theatre, philosophy, and the visual arts. As the sciences study the facts of nature, so humanities studies the values of man through the exploration of creative expressions.

The humanities program offers a flexible and attractive minor. For students majoring in a science or profession, the humanities minor provides an enriching educational experience. For students already majoring in a single humanities discipline, the minor affords a broader awareness of the arts and ideas that shape our world — ancient and modern, eastern and western.

To pursue the 18-hour humanties minor, students must first take the two 3-hour general courses, HUM 2301, 2302. Then they specialize in one of six periods: Classical, Medieval, Renaissance, Enlightenment, Nineteenth Century, or Twentieth Century. Students next complete 12 hours of interdisciplinary study by taking four advanced courses — related to a chosen period — from among three of the following departments: Architecture, Art, Classical and Romance Languages, English, Germanic and Slavic Languages, History, Music, Philosophy, Speech Communication, and Theatre Arts.

For more information, consult the Director, Dr. Dale Davis, Department of English.

Courses in Humanities. (HUM)

2300. Humanistic Studies (3). Study of selected topics in the humanities through *Courses By Newspaper.* May be used once to satisfy the Arts and Sciences humanities requirement. May be repeated once for elective credit.

2301. Introduction to Humanities (3:3:0). An exploration of human values, primarily significant to western civilization, in great works of literature, philosophy, and the arts from the classical Greek and Roman eras to the Renaissance.

2302. Introduction to Humanities (3:3:0). The exploration of contemporary human values through great works of literature, philosophy, and the arts from the Renaissance to the present.

3301. Special Topics in Humanities (3). Prerequisite: Junior standing and consent of instructor.

International Studies. An interdisciplinary minor in international studies is offered to provide students with an extended comprehension of international economic, political, and sociocultural interdependencies. The minor is comprised of a 9-hour core and 9 hours of electives selected from a number of different courses which deal with international topics. The core consists of ECO 3333, International Economics, GEOG 2351, Regional Geography of the World, and POLS 3361, International Politics. Substitutions are permitted in the core by permission of an advisor when it can be shown that they are consistent with the student's major program and academic objectives. Elective courses may be selected from among a wide range of offerings from departments in the College of Arts and Sciences. Courses from other colleges may be accepted if they have been previously approved by the program advisors. For further information, consult one of the following advisors: Dr. Gary Elbow, Department of Geography; Dr. Roger Troub, Department of Economics; Dr. Richard Vengroff, Department of Political Science.

Latin American Area Studies. A major in Latin American area studies for a Bachelor of Arts degree consists of course work in several departments. Additional information may be obtained from the program director, Dr. Neale Pearson, in the Latin American Area Studies office, Room 216, Holden Hall.

For the major, 30 semester hours must be completed in the following three areas and six fields. Nine hours must be taken in each area, and at least 3 hours must be taken in each field. In addition, students must take one of the interdisciplinary Latin American area studies courses: LAAS 2300 or 4300.

Area I	(9 hours)	
	First field:	Upper division Latin American content courses in Spanish or Portuguese.
	Second field:	Portuguese at any level (or Spanish at any level if first field is taken in Portuguese).
Area II	(9 hours)	
	First field:	Upper division Latin American content courses in anthropology; sociology; ARCH 4312.
	Second field:	Latin American geography courses; ECO 3334.
Area III	(9 hours)	
	First field:	Latin American history courses.
	Second field:	Latin American political science courses.

Interdisciplinary Course (3 hours)
LAAS 2300 or 4300

With prior approval, students may plan programs at variance with the above requirements to meet their special interests.

A minor in Latin American area studies consists of 18 hours of Latin American content courses taken from those approved for the major in this program. These 18 hours may include no work in the student's major field and must be taken in at least three of the six fields represented in the program. Either LAAS 2300 or 4300 is recommended for minors.

In addition, the standard requirements for a Bachelor of Arts degree must be met.

Courses in Latin American Area Studies. (LAAS)

2300. Latin America: An Interdisciplinary Introduction (3:3:0). A basic survey of Latin American culture and civilization team-taught by representative members of the Latin American area studies faculty.

4300. Seminar in Latin American Studies (3:3:0). Prerequisite: Consent of the Director of Latin American Area Studies. Interdisciplinary studies in selected Latin American topics. Readings and lectures in English.

Liberal Arts. Freshmen or sophomores may enroll in a general area known as Liberal Arts until they select the major degree program in which they wish to graduate.

Linguistics. The Interdepartmental Committee on Linguistic and Semiotic Studies offers a minor in linguistics for the B.A. degree. The minor consists of 18 hours of both required and elective courses drawn from the departments of Anthropology, Classical and Romance Languages, English, Germanic and Slavic Languages, Mass Communications, Philosophy, Speech Communication, and Theatre Arts. Additional information may be obtained from the Committee Chairperson, Dr. Marianne Cooley, Department of English.

The Interdepartmental Committee on Linguistic and Semiotic Studies also administers master's degree specializations in general and applied linguistics.

Prelaw. Schools of law usually do not require specific courses as part of their admission requirements. Instead, they expect students to be intellectually mature and well grounded in the fundamentals of a liberal education. The prelaw student should keep constantly in mind the various requirements for the bachelor's degree.

Dr. Roger C. Schaefer, Department of Political Science, Dr. Otis W. Templer, Department of Geography, and Dr. John Wunder, Department of History, are the advisors for prelaw students within the College of Arts and Sciences. Regardless of their major field of academic interest, prelaw students should consult one of these advisors for counseling and guidance in planning their programs.

Preprofessional Health Careers. The Health Professions office, located in Room 114 of the Chemistry Building, maintains a collection of current professional school catalogs and materials related to health careers for students. Individual advising regarding schedules and career planning may also be arranged through this office prior to the student's filing a degree plan.

In general, the professional schools do not state a preference about an undergraduate major. Students should choose degree programs suited to their individual interests and abilities and which will offer alternate careers in the event their original plans are changed.

Students are charged with the responsibility for knowing any special requirements of the professional schools which they plan to attend. Applications for evaluations from the Preprofessional Health Careers Committee should be made through the office of the chairperson of the committee, 114 Chemistry Building or Box 4260, Texas Tech University, Lubbock, Texas 79409. Professional aptitude and admission tests may be taken at Texas Tech University.

Courses listed as requirements for the professional areas must be college courses taken for letter grades; however, credit by examination, using the standardized tests described in this catalog, is also acceptable. Science courses are those required of science majors.

Predentistry

The minimum admission requirements for most dental schools in the United States are two years of biological science, one year of general chemistry, one year of organic chemistry, one year of physics (each science having formal laboratory work), and one year of English. Applicants to dental schools are required to take the Dental Admission Test and to submit their applications approximately one year prior to the date of the planned entrance. For admission requirements of a specific dental school, students should consult the latest edition of *Admission Requirements of United States and Canadian Dental Schools* and/or the dental school catalog. Students should plan to complete a bachelor's degree in the field of their choice before entering dental school, although a formal minimum of two college years is stated for some schools.

Premedical

The minimum admission requirements for most medical schools in the United States are one year of English, one-half year of calculus, and the following science courses including laboratory work: two years of biology, one year of general chemistry, one year of organic chemistry, and one year of physics. All applicants to medical schools are required to take the Medical College Admission Test and submit their applications to the schools approximately one year prior to the date of the planned entrance. For admission requirements to a specific medical school, students should consult the latest edition of *Medical School Admission Requirements*.

Students should plan to complete a bachelor's degree in the field of their choice before entering medical school, although not all schools require a degree.

Premedical and predental students may obtain the degree of Bachelor of Arts or Bachelor of Science in one of two ways.

A. The B.A. or B.S. degree may be obtained by completing the requirements as stated in the catalog for the degree desired. The major selected depends on the interest of the student. This major will usually be in one of the sciences; however, other majors are acceptable and may be chosen in colleges other than the College of Arts and Sciences.

B. The B.A. degree may be obtained by completing three years of work totaling a minimum of 100 semester hours in the College of Arts and Sciences and

then graduating from an accredited U.S. or Canadian school of medicine, osteopathy, or dentistry. The following regulations apply:

1. Of the three years of preprofessional work, at least the junior year must be completed in residence at Texas Tech. This minimum will apply to transfer students from other colleges, provided they have satisfactorily completed the work outlined in the freshman and sophomore years or its equivalent.
2. The three years of work must satisfy all graduation requirements for the B.A. degree at Texas Tech, with the exception of the requirements in the major area of study.
3. The applicant for a degree under this plan must submit properly approved credentials from an accredited U.S. or Canadian school of medicine, osteopathy, or dentistry to the effect that the applicant has completed satisfactorily the work leading to a degree of Doctor of Medicine or Doctor of Dental Surgery. Evidence of the degree will substitute for the baccalaureate degree requirements in a major field.

Prepharmacy

The admission requirements for most schools of pharmacy differ somewhat, but most include one year each of biology, general inorganic chemistry, general physics, and organic chemistry and one semester of microbiology with appropriate laboratories; one year of mathematics, including the first semester of calculus; two years of English; one year each of history and political science (United States); one semester of economics; and two semesters of physical education. Students should complete 62 or more hours of course work and take the Pharmacy College Admission Test, if it is required, before applying to the professional schools.

Preoptometry

Admission requirements differ among the various professional schools. These courses fulfill requirements in general: 8 semester hours each of general biology, general chemistry, organic chemistry, and general physics and 4 semester hours of microbiology and physiology including appropriate laboratory work; 6 semester hours of mathematics including the first semester of calculus and 3 semester hours of statistics and psychology; 12 semester hours of English; 6 semester hours each of history and political science (United States); and 2 semesters of physical education. Other recommended courses are biochemistry, logic, and ethics. Students should complete 90 or more semester hours and take the Optometry College Admission Test before applying to the professional schools.

Prephysical Therapy

Students who are preparing to enter professional schools of physical therapy should complete approximately 60 to 90 semester hours. Required courses for most of the schools include 12 semester hours of English; 6 semester hours each of history and political science (United States); 6 semester hours each of sociology and psychology; 3 semester hours of mathematics; 12 semester hours of biology and zoology; 8 semester hours of general chemistry; and 8 semester hours of general physics, including appropriate laboratory work; and 2 semesters of physical education. Courses in speech and statistics are often required.

Other Preprofessional Health Careers

Students who plan other preprofessional programs such as preoccupational therapy, predental hygiene, premedical technology, preradiologic technology, and prephysician's assistant should consult an advisor in the Preprofessional Health Careers office for further information. Information on prenursing is printed separately in this catalog (see Texas Tech University Health Sciences Center School of Nursing and College of Home Economics).

Teacher Education. The curricula of most of the Bachelor of Arts degree programs and some of the Bachelor of Science programs are sufficiently flexible to permit a student to major in an academic subject, yet meet the requirements for certification by taking the required courses in the College of Education. Students should refer to the section of this catalog describing teacher education and should consult with the chairperson of the department in which they wish to major.

Women's Studies. The college offers an interdisciplinary minor in women's studies. Goals of the minor include helping students understand recent reinterpretations of women's nature and role, training individuals for careers with a special focus on women, and encouraging research dealing with the experience of women. The program is administered by the Women's Studies Council, which is composed of selected students and the professors teaching the designated courses. The minor consists of 18 hours of women's studies electives. No more than 6 hours may be taken from any one department and courses counted toward the major will not count toward the minor.

Courses may be selected from the following (asterisks denote courses wherein only sections pertaining to women's studies qualify for the minor): ANTH 3306, HLED 2207, HIST 3322, 3323, 3341, 4399, MCOM *4100, *4390, JOUR *4300, ADV *3160, PHIL *4100, PSY *4300, SOC 2331, 3331, *3337, *4308. Additional information about the minor may be obtained from Dr. Marietta Morrissey, Department of Sociology.

Courses in Women's Studies. (W S)

4300. Women's Studies Seminar (3:3:0). Prerequisite: Junior standing or consent of instructor. An exploration of women's experience and gender definitions from the perspective of several disciplines, including biology, psychology, anthropology, history, literature, art, sociology, political science, and economics.

Department of Anthropology

Associate Professor Philip A. Dennis, Chairperson.
Professors Goss, Mayer-Oakes, and Montgomery; Associate Professors Campbell, Hickerson, Keslin, Lamb, and Way; Visiting Assistant Professor Wills.

This department supervises the following degree programs: *Bachelor of Arts* and *Master of Arts,* ANTHROPOLOGY. The department also participates in the LATIN AMERICAN AREA STUDIES program leading to the *Bachelor of Arts* degree.

A student majoring in anthropology must complete 30 semester hours in anthropology, including ANTH 2301 or 2400, 2302, 3303, 3304, 3305, and 3310 or 3311. PHIL 3331 and HIST 4326 may be credited toward a major in

anthropology. A grade of C or better must be received in each anthropology course by those working for a major or minor in the subject.

Anthropology courses provide distribution credit in all three areas of Arts and Sciences: humanities, natural science, and social/behavioral sciences. Courses so indicated give humanities or natural science credit; all others give social/behavioral sciences credit. In addition, anthropology courses fulfill a variety of humanities and social science requirements in other colleges of the University. Students in other colleges should check with advisors in their major departments to find out which anthropology courses will fulfill their requirements.

Teacher Education. Anthropology may be used for teacher certification under Plan I (double 24-hour major) or Plan II (broad field social science program). Those choosing Plan I (or the 24-hour option in Plan II) should fulfill the following department requirements: ANTH 2301 or 2400, and 2302, plus 6 hours selected from ANTH 3303, 3304, 3305, 3310 (or 3311); plus 12 additional hours from advanced courses (including courses listed above not already selected). Those choosing the 18-hour option of Plan II should fulfill the following department requirements: ANTH 2301 or 2400, and 2302, plus 6 hours selected from ANTH 3303, 3304, 3305, 3310 (or 3311); and 6 additional hours from advanced courses (including courses listed above not already selected).

In addition ANTH 2302 may be used as an alternative to SOC 2301 as a required social science course in Plan II. Other anthropology courses may be counted as the third social science in this program if anthropology has not been selected as the first or second.

Courses in Anthropology. (ANTH)

2301. The Origin and Nature of Man (3:3:0). An introduction to our evolution as a human animal, stressing biological and cultural developments from the rise of primates to the growth of complex societies. (Honors section offered.)

2302. Cultural Anthropology (3:3:0). An introduction to the study of cultures and ways of life, at home and abroad, in Western and non-Western societies, among modern and primitive people. ANTH 2301 is not a prerequisite. (Honors section offered; Spanish language section offered.)

2400. Physical Anthropology (4:3:3). The study of the biological evolution of humans and today's racial variation among them. Includes principles of human heredity and evolution. Laboratory includes study of human bones, fossil casts, primates, body build, skin color, blood types, and population genetics. Counts toward first 8 hours of natural science credit for A&S B.A. degree.

3300. Anthropology and Contemporary Life (3:3:0). The relation of anthropology to topics of current interest in American culture. Content varies. Previous topics have included the writings of Carlos Castaneda and Evolution vs. Creation. May be repeated for credit.

3303. World Ethnology (3:3:0). Prerequisite: ANTH 2302 or consent of instructor. A survey of world culture areas and societies, with in-depth study of such peoples as the Eskimo, the Cheyenne, the Inca of Peru, and modern Mexican villagers.

3304. World Prehistory (3:3:0). Prerequisite: ANTH 2301 or consent of instructor. The study of the origins, development, and characteristics of the major prehistoric cultures of the world from the most primitive beginnings to the emergence of civilizations.

3305. Anthropological Linguistics (3:3:0). Prerequisite: ANTH 2302 or consent of instructor. Survey of the origins and development of human language, phonologi-

cal and grammatical characteristics of languages, and distribution and relationship of languages and language families.

3306. Women in Culture and Society (3:3:0). A comparative study of sex and gender in human society; biological and cultural factors which influence women's roles, status, and their contributions to cultural institutions. Counts toward women's studies minor.

3310. Human Evolution (3:2:3). Prerequisite: ANTH 2301, 2400, or consent of instructor. Study of man's origin and evolution as a mammal, primate, and bioculturally adapting species. Emphasizes principles in evolution and systematics and recent discoveries in paleoanthropology. Gives natural science credit in Arts and Sciences.

3311. Human Variation (3:2:3). Prerequisite: ANTH 2301, 2400, or consent of instructor. ANTH 3310 is not a prerequisite. Study of human heredity and growth of racial origins and adaptations. Survey of the physical and genetic variations of modern populations throughout the world. Gives natural science credit in Arts and Sciences.

3312. Foodways: Patterns and Problems (3:3:0). Prerequisite: Junior standing or consent of instructor. A survey of the anthropological aspects of the world's nutritional/diet patterns and problems. Includes biological, cultural, and prehistoric considerations. Recommended for prehealth professionals.

3315. Health, Medicine, and Culture (3:3:0). The anthropology of health; concepts of illness, health, and aging in different cultures, including the role of the healer in the Third World. Recommended for prehealth professionals.

3323. Man and the Supernatural (3:3:0). An examination of the elements of religion: belief systems, sacred symbols, ritual, and shamanism. Emphasis is on primitive religion. Gives humanities credit in Arts and Sciences.

3325. Anthropological Folklore (3:3:0). The role of folklore not only as entertainment but as explanation and validation of ways of life: myth, parable, legend, proverbs, riddles, and fairy tales. Gives humanities credit in Arts and Sciences.

3329. Political Anthropology (3:3:0). Prerequisite: 3 hours of social science or consent of instructor. The comparative study of nonwestern political and legal systems, including such topics as leadership, law, social conflict, and political change. Offered in cooperation with Political Science Department.

3331. Indians of North America (3:3:0) The experience of the Indian People from their discovery of the New World to their present status.

3332. Peoples of Latin America (3:3:0) The anthropology of Latin America: the high cultures of prehispanic times, the Conquest and colonial periods, and the tribal and peasant peoples of today, including such groups as Amazonian tribesmen, Andean peasants, and the Chicanos. Recommended for Latin American Area Studies students.

3345. North American Archaeology (3:3:0) Prerequisite: ANTH 2301 or 3304, or consent of instructor. A study of the archeological background of aboriginal Americans with a particular interest in the ancient eastern earthwork and western great stone villages.

3346. Ancient Civilizations of Middle and South America (3:3:0) Prerequisite: ANTH 2301 or 3304, or consent of instructor. The origins, development, and cultural achievements of the great civilizations of Middle and South America: the Incas, Aztecs, Mayas, and their predecessors. Gives humanities credit in Arts and Sciences.

3351. Language and Culture (3:3:0) An inquiry into the interrelations of language and other aspects of culture; languages as reflecting or actively molding human perception and experience. Gives humanities credit in Arts and Sciences.

3371. Peoples of the Southwest (3:3:0) The analysis of this area's cultural heritage, including prehistoric and contemporary Indian peoples, and the Anglos, Chicanos, Germans, and other cultural groups of recent times.

4321. Individual Problems in Anthropology (3). Prerequisite: ANTH 2301, 2400, or 2302 plus advanced standing or consent of instructor. Individual studies. May be repeated for credit.

4341. Archaeological Methods and Techniques (3:2:3). Prerequisite: ANTH 2301 or consent of instructor. The study of methods and techniques, such as field reconnaissance and site excavation, laboratory analysis, and reporting, used by archaeologists to determine and define the ancient past of man. Gives natural science credit in Arts and Sciences.

4372. Society and Culture of Mexico (3:3:0) A survey of contemporary Mexico, emphasizing Indians and other peasant villagers, migrants to the cities, and other groups studied by anthropologists. Study of the cultural processes which have created modern Mexico. Taught both on campus and in alternate years as a field course in Mexico.

4380. Museum Techniques (3:2:2). A one-semester course designed to give the student a working knowledge of basic curatorial techniques and some practical experience. Although anthropological collections will be emphasized, the techniques are applicable to various fields. Offered in cooperation with the Museum Science Department.

4601. Archaeology of Mexico (6). A field course. Visits to major archaeological sites and museums in Mexico. Accompanying lectures inform students about the nature and development of early civilization and their legacy in modern Mexico.

4642. Field Archaeology (6). Prerequisite: ANTH 2301 and 4341 or consent of instructor. Actual field work at locations containing prehistoric materials of value. Instruction in proper methods of field reconnaissance, site excavation, and classification of materials will be offered on location. Summer session only. Gives natural science credit in Arts and Sciences.

Department of Art

Professor Terry Morrow, Acting Chairperson.

Professors F. Cheatham, Durland, V. Funk, Gibbons, P. Hanna, Hastie, Howze, Kreneck, Lockhart, and Stephen; Associate Professors Alesch, Bagley, Dixon, Glenn, J. Hanna, Leupp, Mittler, Moon, Queen, Reed, Street, and Waters; Assistant Professors Burton, J. Cheatham, Dingus, Greenebaum, Nagy, and Smith; Lecturers Brotherston, C. Funk, and Martin; Part-time Instructor Ford.

This department supervises the following degree programs: *Bachelor of Fine Arts* in ART, ART EDUCATION, INTERIOR DESIGN, DESIGN COMMUNICATION, and STUDIO; *Bachelor of Arts* in ART; *Master of Art Education* in ART EDUCATION; *Master of Fine Arts* in ART; and the *Doctor of Philosophy* degree in FINE ARTS with an option in Art. The department also directs the certification programs in art education under the Bachelor of Science in Education degree.

The Department of Art is accredited by the National Association of Schools of Art and Design and the Foundation for Interior Design Education Research.

The Department of Art provides degree programs that lead to professional development in the visual arts, a general degree program that leads to a liberal education in the visual arts, minors or specializations in art which are planned specifically for other degree programs, and courses which are designed for nonmajors who desire experiences in the visual arts as part of their liberal education.

The department reserves the right to retain, exhibit, and reproduce work submitted by students for credit in any course. Work submitted for grade is the property of the department and remains such until it is returned to the student by the department.

The freshman and sophomore art curriculum that the department has implemented is consistent with the art curriculum for higher education approved by the Coordinating Board, Texas College and University System. The Department of Art at Texas Tech University therefore respects the standard art core curriculum with regard to transfer credit.

Credits for a course in which a grade of D is earned may not be applied toward fulfillment of the major, minor, or teaching field requirements. Most upper-level studio art courses are repeatable for credit and allow for individualized instruction.

Freshman Core. All students majoring in art and those establishing a teaching field in art are required to take the freshman core which consists of the following courses:

ART 1324	Drawing I: Introduction
ART 1325	Drawing II: Introduction
ART 1320	Design I: Introduction
ART 1331	Design II: Introduction

Art History, 6 hours of Survey

Art Education Major, B.F.A. Degree. This major is designed for students who plan to teach in the public schools and desire depth in art. The student who completes this program will earn broadfield-secondary or all-level certification in art. The B.F.A. for the art education major requires 93 semester hours of professional courses which include 60-63 hours of art and art history, 12-15 hours of art education, and 18 hours of professional education courses. Six hours of the art education courses (ART 4360 and 4361) count as additional hours of professional education to satisfy the 24-hour requirement in that area for certification. The degree also requires 46 semester hours of general studies for a minimum total of 139 hours overall. ART 3360, 3361, 3362, 4360, and 4361 are to be completed before student teaching. Portfolio approval is required for admission into each of the senior-level art education courses.

A student majoring in a studio area may also obtain teacher certification. Students desiring teacher certification with less depth in art may meet certification requirements and be prepared to teach under the Bachelor of Arts degree or the Bachelor of Science in Education degree.

Art Education Curriculum, B.F.A. Degree.

FIRST YEAR

Fall		*Spring*	
ART 1310, Art Hist. Surv. I	3	ART 1311, Art Hist. Surv. II	3
ART 1320, Design I: Intro.	3	ART 1331, Design II: Intro.	3
ART 1324, Drawing I: Intro.	3	ART 1325, Drawing II: Intro.	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
American history	3	American history	3
P.E., Band, ROTC	1	P.E., Band, ROTC	1
	16		16

SECOND YEAR

Fall		*Spring*	
ART 2351, Col., Theory & Prac.	3	Art, Intro. 3-D Studio	3
Art Intro. 2-D Studio	3	ART 3361, Crafts in Elem. Ed. or Art Elec.••†	3
ENGL 2301	3	ENGL 2302	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
Math., For. Lang., or Lab. Science*	3-4	Math., For. Lang., or Lab. Science*	3-4
	15-16		15-16

SUMMER SESSION

First Term		*Second Term*	
EPSY 3330, Ed. Psy.	3	ECEL 3320 or EDSE 3300••	3
Art, Intro. 3-D Studio	3	Art, Intro. 2-D Studio	3
	6		6

THIRD YEAR

Fall		*Spring*	
ART 3360, Hist. & Phil. of Art Ed.	3	ART 4360, Art in Sec. Ed.	3
Art, Intro. 2-D Studio	3	ART 3362, Pres. Tech. I	3
Art, Intro. 3-D Studio	3	Art elective†	3
EDSE 3321, Curric. Dev. in Sec. Ed.	3	Upper Level Art History	3
Math., For. Lang., or Lab. Science*	3-4	Math., For. Lang., Lab. Science, or General elective*†	3-4
	15-16		15-16

SUMMER SESSION

First Term		*Second Term*	
General elective†	3	Art elective†	3
Art elective†	3	General elective†	3
	6		6

FOURTH YEAR

Fall		*Spring*	
ART 4361, Sec. Art Curriculum	3	ECEL 4391 and EDSE 4392, or EDSE 4692••	6
ECEL 3350, 3360, EDCI 3386 or EDSE 4320••	3		
Upper Level Art History	3		6
Art elective†	3		
Art elective†	3		
	15		

†Approval of faculty advisor required; general elective not to include art or education.
*12-16 semester hours required in two (only) of these three areas with a corresponding 4-8 semester hours of general electives required.
••First course(s) listed is required for all-level; the second is required for broadfield-secondary certification.

Design Communication Major, B.F.A. Degree. This program offers a concentration of professional courses in the field of design communication. The student has the opportunity to prepare for a career in graphic design, advertising design, publication design, package design, corporate design, illustration, and photography.

The design communication curriculum consists of 90 semester hours of art and art history and 44-46 semester hours of general degree requirements. The 90 semester hours of art and art history include 30 hours in the major, 9-12 hours in the specialization area, 24 hours in studio fine arts, a minimum of 12 hours in art history, and 12-15 hours of art electives. Specialization areas are photography,

package design, and illustration. Junior and senior level design communication courses require portfolio approval by the design faculty as a condition for admission.

Design Communication Curriculum, B.F.A. Degree.

FIRST YEAR

Fall		*Spring*	
ART 1310, Art Hist. Surv. I	3	ART 1311, Art Hist. Surv. II	3
ART 1320, Design I: Intro.	3	ART 1331, Design II: Intro.	3
ART 1324, Drawing I: Intro.	3	ART 1325, Drawing II: Intro.	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
American history	3	American history	3
P.E., Band, ROTC	1	P.E., Band, ROTC	1
	16		16

SECOND YEAR

Fall		*Spring*	
ART 2350, Intro. to Design Comm.	3	ART 2353, Design Com.	3
ART 2351, Color Theory & Pract.	3	ART 2352, Design Phil. & Prin.	3
ART 2320, Drawing III: Life Drawing	3	ART 3351, Lettering	3
Art, Intro. 3-D Studio	3	Art, Intro. 2-D Studio	3
ENGL 2301	3	ENGL 2302 or PHIL 2310 or SCOM 1301	3
	15		15

SUMMER SESSION

First Term		*Second Term*	
SCOM 3308, Bus. & Prof. Speech	3	General elective†	3
PSY 1300, Gen. Psych.	3	Mathematics	3
	6		6

THIRD YEAR

Fall		*Spring*	
ART 3352, Inter. Design Comm.	3	ART 3352, Inter. Design Comm.	3
ART 3325, 3351, 3356, or 3354	3	Des. Comm. Specialization Req.†	3
Upper Level Art History	3	Humanities/Social Sci. Elect.	3-4
Humanities/Social Sci. Elect.	3-4	ART 3320, Adv. Life Drawing	3
ART 3350, Typo. & Prod. Prob.	3	Upper Level Art History	3
	15-16		15-16

FOURTH YEAR

Fall		*Spring*	
ART 4352, Adv. Design Comm.	3	ART 4352, Adv. Design Comm.	3
Des. Comm. Specialization Req.†	3	Des. Comm. Specialization Req.†	3
Studio Art elective†	3	Studio Art elective†	6
Art elective†	3	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3		15
	15		

†Approval of faculty advisor required; general elective not to include art.

Interior Design Major, B.F.A. Degree. This curriculum provides the preparation for a career as a professional interior designer by offering the interior design students a concentration of art courses. The B.F.A. for the interior design major requires 84 semester hours of art and art history and 54 semester hours of general requirements. Included in the 84 hours of art and art history are 45 hours in interior design, 27 hours in studio fine arts or design, and 12 hours in art history.

Junior and senior level studio interior design courses require portfolio approval as a condition for admission.

Interior Design Curriculum, B.F.A. Degree.

FIRST YEAR

Fall		*Spring*	
ART 1310, Art Hist. Surv. I	3	ART 1311, Art Hist. Surv. II	3
ART 1320, Design I: Intro.	3	ART 1331, Design II: Intro.	3
ART 1324, Drawing I: Intro.	3	ART 1325, Drawing II: Intro.	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1320, Coll. Algebra	3	MATH 1321, Trigonometry	3
P.E., Band, ROTC	1	P.E., Band, ROTC	1
	16		16

SECOND YEAR

Fall		*Spring*	
ART 2340, Intro. Int. Des.	3	ART 2341, Beg. Int. Des. Studio	3
ART 2322 or 3341	3	ART 2322 or 3341	3
ART 3340, Hist. of Int.	3	ART 3342, Cont. Int.	3
ENGL 2301	3	Physics	4
Arch./For. Lang. Elect.*	3-4	Arch./For. Lang. Elect.*	3-4
	15-16		16-17

SUMMER SESSION

First Term		*Second Term*	
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
Studio Art elective*	3	Studio Art elective*	3
	6		6

THIRD YEAR

Fall		*Spring*	
ART 3344, Equip. & Mat. Inter.	3	ART 3345, Int. Des. Graph. II	3
ART 3343, Int. Des. Graph. I	3	ART 3346, Studio Procedures	3
ART 4340, Res. Int.	3	Arch./For. Lang. Elect*	3
Upper Level Art Hist.	3	Studio Art elective	3
ENGL 2302 or PHIL 2310 or SCOM 1301	3	American history	3
	15		15

SUMMER SESSION

First Term		*Second Term*	
American history	3	Studio Art elective*	3
General elective*	3		
	6		3

FOURTH YEAR

Fall		*Spring*	
ART 4341, Commercial Int.	3	ART 4344, Fieldwork in Int. Des.	3
ART 4342, Adv. Interior Prob.	3	ART 4341, Commercial Int.	3
Upper Level Art History	3	ART 4343, Res. Dyn. Int. Space	3
General elective*	3	General elective*	1-3
	12		10-12

*Approval of faculty advisor required; general elective not to include art.

Studio Major, B.F.A. Degree. This major is planned to offer depth in the studio areas. The B.F.A. with a studio art major requires 81 semester hours of art

and art history and 46-50 semester hours of general requirements. The professional area includes a primary studio area of 21-27 hours, a secondary studio area of 12-15 hours, and a minimum of 12 hours of art history. The student selects two of the following areas as the primary and secondary studio specializations: ceramics, drawing, enameling, jewelry, painting, photography, printmaking, sculpture, and textile design. A student majoring in studio art may be required to pass a portfolio review by the studio faculty as a condition to enroll in junior and senior level studio courses.

Studio Art Curriculum, B.F.A. Degree.

FIRST YEAR

Fall		*Spring*	
ART 1320, Design I: Intro.	3	ART 1331, Design II: Intro.	3
ART 1324, Drawing I: Intro.	3	ART 1325, Drawing II: Intro.	3
ART 1310, Art Hist. Survey I	3	ART 1311, Art Hist. Survey II	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
American history	3	American history	3
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	16		16

SECOND YEAR

Fall		*Spring*	
Art, Intro. 2-D Studio	3	ART 2320 or option of	
Art, Intro. 3-D Studio	3	ART 2336 for 3-D majors	3
POLS 2301, Amer. Govt., Org.	3	Art, Intro. 2-D or 3-D Studio	3
ENGL 2301	3	POLS 2302, Amer. Pub. Policy	3
Studio or Design elective	3	ENGL 2302 or SCOM 1301 or	
	15	PHIL 2310	3
		Studio specialization†	3
			15

THIRD YEAR

Fall		*Spring*	
Studio specialization†	9	Studio specialization†	9
Foreign language	3-4	Foreign language	3-4
Lab. Science	4	Lab. Science	4
	16-17		16-17

SUMMER SESSION

First Term		*Second Term*	
Studio specialization†	3	Studio specialization†	3
Art elective†	3		
	6		3

FOURTH YEAR

Fall		*Spring*	
General Degree Requirement*	3	General Degree Requirement*	3
General elective†	2-4	General elective†	3
Studio specialization†	6	Studio specialization†	6
Upper Level Art History	3	Upper Level Art History	3
	14-16		15

†Approval of faculty advisor required; general elective not to include art.
*Anthropology, foreign language, PHOT 2301, philosophy, psychology, PHYS 3307, sociology, or mathematics.

Art Major, B.A. Degree. This major includes three specializations: (1) a nonprofessional general art specialization, (2) an art history specialization, and (3) an art education plan leading to secondary-broadfield or all-level certification in art.

Students working toward the general nonprofessional art specialization must complete the freshman core in art, sufficient electives in art to total 42 hours, including the freshman core, and the other requirements for the Bachelor of Arts degree.

Students working toward the art history specialization must complete the freshman core in art, 24 hours of upper level art history electives (to be selected with written consent of an advisor), and the other requirements for the Bachelor of Arts degree.

Students working toward the art education specialization must complete the freshman core in art, the art requirements as listed under Teacher Education, 18 semester hours in professional education required for secondary-broadfield or all-level certification in art, and the other requirements for the Bachelor of Arts degree.

Teacher Education. In addition to the art education major, B.F.A. degree, two other programs are offered to meet broadfield-secondary and all-level certification in art. These certification plans are available through the Bachelor of Arts (137 hours) and Bachelor of Science in Education (126 hours) degrees. Interested students should see the art education advisor. Students must receive at least a C grade in each of the following courses: ART 3360, 3361, 3362, 4360, and 4361. These courses are to be completed before student teaching. Portfolio approval is required for admission into each of the senior level art education courses. A student majoring in a studio area may also obtain teacher certification.

Teacher Education Curriculum, B.A. Degree/B.S. in Education Degree.

FIRST YEAR

Fall		*Spring*	
ART 1310, Art Hist. Survey I	3	ART 1311, Art Hist. Survey II	3
ART 1320, Design I: Intro.	3	ART 1331, Design II: Intro.	3
ART 1324, Drawing I: Intro.	3	ART 1325, Drawing II: Intro.	3
General Degree Requirements	7	General Degree Requirements	7
	16		16

SECOND YEAR

Fall		*Spring*	
Art, Intro. 2-D Studio	3	ART 3361, or Art Elective••	3
General Degree Requirements	14	Art, Intro. 3-D Studio	3
	17	General Degree Requirements	11
			17

SUMMER SESSION

EPSY 3330, Ed. Psychology	3
ECEL 3320 or EDSE 3300••	3
	6

THIRD YEAR

Fall		*Spring*	
ART 3360, Hist. & Phil. Art Ed.	3	ART 4360, Art in Secondary Ed.	3
Art, Intro. 2-D Studio	3	ART 3362, Presentation Tech. I	3
Art, Intro. 3-D Studio	3	Art, Intro. 3-D Studio	3
EDSE 3321, Curric. Dev.	3	Upper Level Art Elective†	3
General Degree Requirements*	4-5	General Degree Requirement*	4-5
	*16-17		*16-17

FOURTH YEAR

Fall		*Spring*	
ART 4361, Secondary Art Curr.	3	ECEL 4391 and EDSE 4392, or EDSE 4692**	6
ECEL 3350, 3360, EDCI 3386 or EDSE 4320**	3	General Degree Requirements	3
Upper Level Art elective†	3		—
General Degree Requirements*	6-9		9
	*15-18		

*First figure represents requirement for B.S. in Education; the second represents requirement for B.A. degree.
**First course(s) listed is required for all-level; the second is required for broadfield-secondary certification.
†Approval of faculty advisor required.

Courses in Art. (ART)

1310. Art History Survey I (3:3:0). A survey of painting, sculpture, architecture, and the minor arts from prehistoric times to the 14th century.

1311. Art History Survey II (3:3:0). A survey of painting, sculpture, architecture, and the minor arts from the 14th century to the present.

1320. Design I: Introduction (3:0:6). Emphasis upon two-dimensional design; includes the fundamentals of line, color, value, texture, shape, space, and compositional arrangement. Outside assignments required.

1324. Drawing I: Introduction (3:0:6). A beginning course investigating a variety of media, techniques, and subjects, exploring perceptual and descriptive possibilities with consideration of drawing as a developmental process as well as an end in itself. Outside assignments required.

1325. Drawing II: Introduction (3:0:6). Prerequisite: ART 1324. Expansion of Drawing I stressing the expressive and conceptual aspects of drawing including the human figure within a spatial environment. Outside assignments required.

1331. Design II: Introduction (3:0:6). Prerequisite: ART 1320. Continuation of Design I with emphasis upon the three-dimensional concept. Outside assignments required.

1370. Survey of Design (3:1:4). For nonmajors, a hands-on studio experience with the elements and principles of design.

1371. Survey of Drawing (3:0:6). For nonmajors, a hands-on studio experience with freehand drawing.

2320. Drawing III: Life Drawing (3:0:6). Prerequisite: Freshman art core. Study of anatomical structure, drawing from life. Outside assignments required.

2322. Painting I: Introduction to Watercolor (3:0:6). Prerequisite: Freshman art core. Introduction to basic painting in watercolor. Outside assignments required.

2323. Painting I: Introduction (3:0:6). Prerequisite: Freshman art core. Introduction to basic painting in oil or synthetic media. Outside assignments required. ART 3322 may be substituted for this course.

2328. Printmaking I: Introduction (3:0:6). Prerequisite: Freshman art core. Problems in major printmaking areas. Emphasis on materials and techniques. Outside assignments required. ART 3328 or 4328 may be substituted for this course.

2330. Ceramics I: Introduction (3:0:6). Prerequisite: Freshman art core. Hand building methods, glaze application, and decorative techniques in clay. Outside assignments required. May be repeated for credit.

2332. Enameling I: Introduction (3:0:6). Prerequisite: Freshman art core or departmental approval. Basic processes of enameling on metal. Outside assignments required. May be repeated for credit.

2334. Jewelry I: Introduction (3:0:6). Prerequisite: Freshman art core. Basic techniques of jewelry fabrication. Outside assignments required. May be repeated for credit.

2336. Life Modeling (3:0:6). Prerequisite: Freshman art core. Study of anatomical structure, modeling from life in plastic materials. Outside assignments required.

2338. Sculpture I: Introduction (3:0:6). Prerequisite: Freshman art core. Basic sculptural techniques and concepts dealing with form and space. Outside assignments required. May be repeated for credit.

2339. Textile Design I: Introduction (3:0:6). Prerequisite: Freshman art core or departmental approval. Textile design through a variety of decorative and structural processes. Outside assignments required. May be repeated for credit.

2340. Introduction to Interior Design (3:3:0). Prerequisite: Freshman art core. Opportunities open to interior designers; competencies needed. Exploration of design as it relates to living and working environments of individuals.

2341. Beginning Interior Design Studio (3:0:6). Prerequisite: ART 2340. Introduction to functional and aesthetic use of interior space and its impact on individuals. Floor plans and working drawings. Outside assignments required.

2350. Introduction to Design Communication (3:0:6). Prerequisite: Freshman art core. Theory of visual communication with basic problems in visual and visual-verbal communication. Outside assignments required.

2351. Color Theory and Practice (3:0:6). Prerequisite: Freshman art core. An introduction to basic color theories and their application in design, investigation of physical aspects of color perception and manipulation using the subtractive color process. May be repeated once for credit with instructor's approval. Outside assignments required.

2352. Design Philosophy and Principles (3:0:6). Prerequisite: ART 2350. The identification and use of various historical approaches to design and aesthetics. Experiments in two- and three-dimensional design to test various theories, principles, styles, and techniques. Outside assignments required.

2353. Design Communication (3:0:6). Prerequisite: ART 2351 and 2350. Basic problems in graphic design related to design communication incorporating visual-verbal communication for two-dimensional printed media. Outside assignments required.

3310. Greek and Roman Art (3:3:0). Prerequisite: ART 1310 or consent of instructor. An examination of the principal contributions of the classical world in the areas of architecture, sculpture, and painting. May be repeated once for credit with different emphasis.

3311. Native American Arts of the Southwest (3:3:0). An examination of native American cultures of the southwest United States as revealed in ancient and contemporary architecture, arts, and crafts.

3312. 20th Century Art (3:3:0). Prerequisite: ART 1311 or consent of instructor. An examination of the principal contributions of the 20th century in the areas of architecture, sculpture, and painting. May be repeated once for credit with different emphasis.

3313. The Art of the Middle Ages (3:3:0). Prerequisite: ART 1310 or consent of instructor. An examination of the principal contributions of the medieval period in the areas of architecture, sculpture, and painting.

3314. American Art (3:3:0). Prerequisite: ART 1311 or consent of instructor. An examination of the principal American contributions in the areas of architecture, sculpture, and painting from the 17th century to the present.

3315. Ancient Near Eastern and Egyptian Art (3:3:0). Prerequisite: ART 1310 or consent of instructor. A discussion of Ancient Near Eastern art and architecture from Neolithic times down to ca. 500 B.C. and the arrival of the Greeks in Persia; Ancient Egyptian art and architecture is covered from predynastic to the conquest of Egypt by Rome in 31 B.C.

3316. 19th Century Art (3:3:0). Prerequisite: ART 1311 or consent of instructor. A survey of the art works and the aesthetic philosophies that colored and interacted with the social, political, and economic persuasions of the age of Revolution.

3317. Baroque Art (3:3:0). Prerequisite: ART 1311 or consent of instructor. A view of European art of the Counter Reformation, and a consideration of the prevailing pressures that produced this art: an analysis of the devices, effects, and dynamics of the age of change. May be repeated once for credit with different emphasis.

3318. The Art of the Renaissance (3:3:0). Prerequisite: ART 1311 or consent of the instructor. A study of aesthetic and intellectual directions in the age of Humanism. May be repeated once for credit with different emphasis.

3319. Photographic Arts of the 19th & 20th Centuries (3:3:0). Prerequisite: ART 1311 or consent of the instructor. An examination of the development of photography and its relation to the other visual arts.

3320. Advanced Life Drawing (3:0:9). Prerequisite: ART 2320. Drawing from life in a variety of media and approaches with emphasis upon aesthetic factors. May be repeated for credit.

3322. Advanced Painting (3:0:9). Prerequisite: Freshman art core. Open to beginning through advanced students. Figurative or nonobjective painting in oils, synthetic media, or watercolor. May be taken in lieu of ART 2323. May be repeated for credit.

3325. Photographic Media in Art (3:0:9). Prerequisite: Freshman art core. Survey of basic photographic processes adaptable for exploration and individual expression in contemporary art forms. May be repeated for credit.

3326. Photographic Arts II (3:0:9). Prerequisite: PHOT 2301. Advanced use of black and white and color still photography with emphasis toward editorial and advertising utilization and the media as an art form. May be repeated for credit.

3328. Advanced Printmaking (3:0:9). Prerequisite: Freshman art core. Open to beginning through advanced students. In-depth study of printmaking methods of silkscreens, lithography, etching, or woodblock. May be taken in lieu of ART 2328. May be repeated for credit.

3330. Ceramics (3:0:9). Prerequisite: Freshman art core or departmental approval. Development of individual direction and exploration of various clay techniques. Emphasis varies. May be repeated for credit.

3332. Enameling (3:0:9). Prerequisite: Freshman art core or departmental approval. Development of individual direction and exploration of various techniques and media. Emphasis varies. May be repeated for credit.

3333. Glass (3:0:9). Prerequisite: Freshman art core or departmental approval. Development of individual direction and exploration of various techniques in glass. Emphasis varies. May be repeated for credit.

3334. Jewelry (3:0:9). Prerequisite: Freshman art core or departmental approval. Development of individual direction and exploration of various media and techniques. Emphasis varies. May be repeated for credit.

3338. Sculpture (3:0:9). Prerequisite: Freshman art core or departmental approval. Development of individual direction and exploration of various techniques and media. Emphasis varies. May be repeated for credit.

3339. Textile Design (3:0:9). Prerequisite: Freshman art core or departmental approval. Development of individual direction and exploration of various techniques including weaving, dyeing, soft sculpture, and others. Emphasis varies. May be repeated for credit.

3340. History of Interiors (3:3:0). Survey of historical interiors as an expression of an era. Egyptian to twentieth century.

3341. Visual Thinking for Designers (3:0:9). Prerequisite: Freshman art core. Introduction to visual techniques perspective with emphasis on descriptive development of geometric systems and visual language for all design majors.

3342. Contemporary Interiors (3:3:0). Technological advancement and subsequent evolution of design philosophies reflected in furnishings and interiors of the late nineteenth and twentieth centuries.

3343. Interior Design Graphics I (3:0:9). Prerequisite: ART 2341, 3341, and portfolio evaluation. Exploration of the techniques and materials of graphic representation which support interior design presentations.

3344. Equipment and Materials for Interiors (3:3:0). Prerequisite: Junior standing and ART 2340. Materials, equipment, and services available to the interior designer for meeting client's needs.

3345. Interior Design Graphics II (3:0:9). Prerequisite: ART 3343, 4340, and portfolio evaluation. Visual presentation of design-idea through use of freehand perspective drawing and rendering in mixed media.

3346. Studio Procedures and Professional Practices for Interior Designers (3:3:0). Prerequisite: Junior standing, interior design. Professional opportunities as they relate to individual competencies. Preparation of resume5. Study of studio procedures — ethics, business, and legal aspects.

3350. Typographic and Production Problems (3:0:9). Prerequisite: ART 2350, 2351. Families of type, type indication and specification, use of type as a design element, printing, and preparation of art for printed media.

3351. Lettering (3:0:9). Prerequisite: Freshman art core or consent of instructor. Analysis of letterforms, lettering for reproduction, practical use of letterform in design applications. May be repeated for credit.

3352, 3353. Intermediate Design Communication (3:0:9 each). Prerequisite: ART 2353 and portfolio evaluation. Problems in graphic design, design communication, incorporating visual-verbal communication for various media. May be repeated for credit.

3354. Illustration I (3:0:9). Prerequisite: ART 3320. Planning and rendering of advertising and editorial illustrations in various media. May be repeated once for credit.

3356. Packaging Design (3:0:9). Prerequisite: ART 2350 and 2351. Retail packaging and new product introduction. May be repeated once for credit.

3360. History and Philosophies of Art Education in the Elementary School (3:2:4). Prerequisite: Freshman art core. An investigation of the history and major philosophies of teaching visual arts with emphasis on the elementary school. For art education majors only.

3361. Crafts in Elementary Education (3:1:4). Application of current art education practices regarding three-dimensional work in providing creative experiences for children.

3362. Presentation Techniques I (3:0:9). Prerequisite: Freshman art core. Exploration of different areas of visual presentation to include lettering, graphic representation and organization, and other display techniques.

3370. Survey of Sculpture (3:0:6). For nonmajors, a hands-on studio experience with materials and techniques of sculpture, from plaster to bronze. Includes basic welding and metal casting techniques. May be repeated for credit.

3371. Survey of Ceramics (3:0:6). For nonmajors, a hands-on studio experience with ceramics. May be repeated for credit.

3372. Art in Elementary Education (3:1:4). For nonmajors, a practical application of current art education theories in promoting creative experiences for children.

3373. Survey of Painting (3:0:6). For nonmajors, a hands-on studio experience with various painting techniques and media. May be repeated for credit.

3374. Survey of Crafts (3:0:6). For nonmajors, a hands-on studio experience with various craft techniques and media. May be repeated for credit.

3375. Puppetry (3:0:6). Designed to develop knowledge, understanding, and appreciation of exploratory and creative experiences with materials, processes, and presentations involved in the field of puppetry. May be repeated for credit.

3376. Survey of Jewelry (3:0:6). For nonmajors, a hands-on studio experience with jewelry techniques. May be repeated for credit.

3377. Art Education for the Young Child (3:1:4). A study of the visual arts as they relate to the very young art learner and his aesthetic, creative, and perceptual growth.

4104. Advanced Problems (1). Prerequisite: Departmental approval. Advanced problems in an area of production in which student has achieved competence. May be repeated for credit.

4304. Advanced Problems (3). Prerequisite: Departmental approval. Advanced problems in area of production in which student has achieved competence. May be repeated for credit.

4310. Seminar in Art History (3:3:0). Prerequsite: 6 hours of art history. Extensive exploration of a particular period in art history. May be repeated for credit.

4311. Special Problems in Art History (3:3:0). Prerequisite: Consent of instructor. An in-depth art history research course designed for maximum flexibility between the instructor and advanced student. May be repeated for credit.

4312. Seminar in 20th Century Art (3:3:0). Prerequisite: ART 3312 or consent of instructor. Extensive exploration of a particular area of 20th century art. May be repeated for credit.

4320. Experimental Drawing (3:0:9). Prerequisite: ART 3320 and departmental approval. Complete absorption with drawing as a total concept. Mature, individualistic exploration of drawing utilizing a variety of media and surfaces. May be repeated for credit.

4322. Experimental Painting (3:0:9). Prerequisite: ART 3322 and departmental approval. Advanced exploration into aesthetics on a more individual basis. May be repeated for credit.

4328. Experimental Printmaking (3:0:9). Prerequisite: Freshman art core. Open to beginning through advanced students. Problems in printmaking areas. Controlled projects and individual criticism. May be taken in lieu of ART 2328. May be repeated for credit.

4330. Experimental Ceramics (3:0:9). Prerequisite: ART 2330 or 3330 or equivalent. Individual studies directed toward developing professional statement in clay; kiln construction and firing. May be repeated for credit.

4334. Experimental Jewelry (3:0:9). Prerequisite: ART 2334 or 3334 or equivalent. Individual studies directed toward developing professional statement in jewelry. May be repeated for credit.

4338. Experimental Sculpture (3:0:9). Prerequisite: ART 2338 or 3338 or equivalent. Individual studies directed toward developing professional statement in sculpture. May be repeated for credit.

4339. Experimental Textile Design (3:0:9). Prerequisite: ART 2339 or 3339 or equivalent. Individual studies directed toward developing professional statement in textile design. May be repeated for credit.

4340. Residential Interiors (3:0:9). Prerequisite: ART 2341 and portfolio evaluation. Problems in design of living spaces. Emphasis on human dimension and human needs. May be repeated for credit.

4341. Commercial Interiors (3:0:9). Prerequisite: ART 3345 and portfolio evaluation. Space use, furnishings, atmosphere in commercial interiors. May be repeated for credit.

4342. Advanced Interior Problems (3:0:9). Prerequisite: Consent of instructor and portfolio evaluation. Individual research into design problems and resultant execution of design-solutions. May be repeated for credit.

4343. Research in Dynamics of Interior Space (3:0:9). Prerequisite: Consent of instructor and portfolio evaluation. Research problems related to design and utilization of interior architectural spaces.

4344. Fieldwork in Interior Design (3:1:8). Prerequisite: Consent of instructor. Provides opportunity for student to observe and participate in determination of client preferences and needs, studio procedures, and operation. Some emphasis on portfolio preparation.

4352. Advanced Design Communication (3:0:9). Prerequisite: Intermediate design communication, two semesters, and portfolio evaluation. Advanced problems in design communication in various media with emphasis on portfolio preparation. May be repeated for credit.

4354. Advanced Illustration (3:0:9). Prerequisite: ART 3354 and portfolio approval. Experimental approach to illustration for editorial and advertising purposes with attention to the individual portfolio. May be repeated for credit.

4356. Corporate Identity and Architectural Graphics (3:0:9). Prerequisite: ART 3356. The total graphic concept as applied to retail outlets, manufacturers, or services with special emphasis on advanced problems in packaging. May be repeated for credit.

4360. Art in Secondary Education (3:2:4). Prerequisite: ART 3360 and portfolio evaluation. An investigation of the teaching of the visual arts in secondary schools and its relationship to the history and philosophies of art education. For art education majors only.

4361. Secondary Art Curriculum (3:2:4). Prerequisite: ART 4360 and portfolio evaluation. An investigation and study of current art education practices and research regarding the secondary schools. For art education majors only.

4370, 4371. Art and Ideas (3:3:0 each). Prerequisite: Junior classification. An examination of major intellectual concepts as they recur in the art production of various cultures and time periods. For nonmajors only.

Department of Biblical Literature

Don W. Prince, Chairperson.
Instructors Hanly, Mickey, Moore, Preisinger, Prince, and Weisberg.

The objective of this department is to provide sound academic courses in religious studies generally, as well as in the literature found in the Bible. The department offers courses in different areas of concern, such as world religions, Biblical studies, history of religion, and cultural and social religious studies. Credit may be obtained for as many as 12 academic hours which are counted as electives toward regular degree plans.

Courses in Religion. (RELG)

1300. Introduction to Religion (3:3:0). A study of the general characteristics of religion including the interaction of religion with culture and the historical development of religion.

1301. Introduction to the Old Testament (3:3:0). A study of the history, literature, and significant teachings of the Old Testament.

1302. Introduction to the New Testament (3:3:0). A study of the history, literature, and significant teachings of the New Testament.

2303. Christian Ethics (3:3:0). A study of how one decides to act from a Christian perspective. The Bible and major contemporary theologians will be primary resources as specific moral problems (war, sex and family, poverty, abortion, and racism) are research for possible Christian responses.

2305. The Old Testament Prophets (3:3:0). The prophetic movement and its relationship to religious, social, and political traditions and institutions of the ancient Near East.

2306. The Gospels (3:3:0). A literary, historical, and critical study of the Gospels. Special attention will be given to the study of the life and teachings of Jesus as presented within the Gospels.

3301. Old Testament Poetry and Wisdom Literature (3:3:0). Selected studies from the Psalms, together with an examination of the Wisdom literature with special studies in Job, Proverbs, and Ecclesiastes.

3302. Pauline Theology (3:3:0). The doctrinal, pastorial, and personal epistles of Paul are explored in the light of their historical and geographical settings, the organization of the Apostolic Church, and the development of Christian doctrine.

3303. History of Christian Thought I: 100-1450 A.D. (3:3:0). The development of Christian systems of thought, from New Testament times to the pre-Reformation period.

3304. History of Christian Thought II: 1450-1800 A.D. (3:3:0). The development of Christian systems of thought from the Reformation period to the nineteenth century.

3309. World Religions (3:3:0). A study of the important features of various religions (e.g., Primitivism, Zoroastrianism, Hinduism, Buddhism, Confucianism, Taoism, Shinto, Zen, Islam, etc.).

4301. Modern Christian Thought (3:3:0). The development of Christian systems of thought from the Enlightenment to the present.

4302. The Pentateuch (3:3:0). The origin, history, and religious concepts of the Old Testament books of Law. Special attention given to the problems of Genesis.

4303. Apocalyptic Literature (3:3:0). A study of the creation and development of apocalyptic material from the middle of the Babylonian Exile of the Jews (c. 550 B.C.) to the writing of the book of Revelation (c. 100 A.D.).

4305. Special Problems in Religion (3:3:0). Depth study of special problems such as war/violence, of special persons who have contributed to this age such as Dietrich Bonhoeffer, Martin Luther King; of connections and contributions of religion and art; of new ethnic religions, sects, or branches of older religions with particular contemporary significance.

Department of Biological Sciences

Professor Larry S. Roberts, Chairperson.

Horn Professor Baker; Professors Berlin, Burns, Camp, Cavazos, Goodin, Jackson, Jones, Mecham, Mitchell, Morey, Proctor, Rose, and Rylander; Associate Professors Allen, Baugh, Brady, Coulter, Elliot, Francke, Hartman, Heintz, and Northington; Assistant Professors Beck, Bilimoria, Chesser, Diffley, Doohan, Fuller, Holaday, Kamp, Sutherland, Tilton, and Willig.

This department supervises the following degree programs: BIOLOGY, *Bachelor of Science, Master of Science, Doctor of Philosophy;* BOTANY, *Bache-*

lor of Arts, Bachelor of Science, Master of Science; MICROBIOLOGY, *Bachelor of Arts, Bachelor of Science, Master of Science, Doctor of Philosophy;* ZOOLOGY, *Bachelor of Arts, Bachelor of Science, Master of Science, Doctor of Philosophy.*

Students majoring in biology for the B.S. degree must complete a minimum of 36 semester hours from this department: BIOL 1403, 1404, 2100, 3102, 3301 plus at least one course from each of the following groups of courses. Group I — BIOL 3302, 3420, BOT 3401, MBIO 3401, ZOOL 4409; Group II — BIOL 3303, 3307, 4305, ZOOL 4312; Group III — BOT 3303, 3304, ZOOL 3406, 4307; Group IV — an additional junior or senior level botany course; Group V — an additional junior or senior level zoology course (or ZOOL 2405) plus additional hours at the junior or senior level in the Department of Biological Sciences for a minimum of 36 semester hours. A course selected from among the first three groups listed above may *not* also satisfy the requirement for a botany or zoology course (Groups IV and V).

Students majoring in botany for the B.S. degree must complete a minimum of 36 hours of the following courses from this department: BIOL 1403, 1404, 2100, 3102, 3301, and 3420 plus any four of the following six courses: BOT 3303, 3304, 3309, 3401, BIOL 3303 or MBIO 3400 (or MBIO 3401), plus additional junior or senior level courses in the department to attain a minimum of 36 credit hours.

Students majoring in microbiology for the B.S. degree must complete a minimum of 36 hours of the following courses from this department: BIOL 1403, 1404, MBIO 2100, 3301, 3401, 3420, 4303, and either MBIO 4102 or BIOL 4101; plus two of the following courses: MBIO 4306, 4310, 4402, 4404, 4308; plus additional hours from the following courses to complete the 36-hour requirement: MBIO 3102, 3300, 3303, 3406, 4101, 4102, 4306, 4307, 4308, 4309, 4310, 4402, 4404, 4311, 4323.

Students majoring in zoology for the B.S. degree must complete a minimum of 36 hours of the following courses from this department: BIOL 1403, 1404, 2100, 3102, 3301, 3420; plus at least one course from each of the following pairs of courses: ZOOL 2405 or 4307; ZOOL 3406 or 3303, BIOL 3302 or ZOOL 4409, BIOL 3303 or 4305; plus additional courses at the junior or senior level in the Department of Biological Sciences or the Department of Entomology, for a total of 36 semester hours. It is recommended that premedical or predental students take ZOOL 2405 and ZOOL 3303.

Students majoring in biology, microbiology, botany, or zoology may minor in any of these fields provided that the major and minor are not in the same field. Other recommended minors, subject to approval by the department, are in such areas as chemistry, geosciences, physics, mathematics, entomology, animal science, plant and soil science, and range and wildlife management.

One semester of organic chemistry is required of all majors within this department, and it is urged that it be taken during the second year of study. Microbiology majors are required to complete two semesters of organic chemistry. Students whose area of interest requires a strong background in chemistry should complete a chemistry minor.

Students who contemplate a professional career in one of the areas of biological sciences are strongly urged to complete one semester of calculus.

Biological Sciences Curricula.

Biology		Botany		Microbiology		Zoology	
FIRST YEAR							
BIOL 1403, 1404	8	BIOL 1403, 1404	8	BIOL 1403, 1404	8	BIOL 1403, 1404	8
CHEM 1101, 1102	2	CHEM 1101, 1102	2	CHEM 1101, 1102	2	CHEM 1101, 1102	2
**CHEM 1307, 1308	6	**CHEM 1307, 1308	6	**CHEM 1307, 1308	6	**CHEM 1307, 1308	6
ENGL 1301, 1302	6	ENGL 1301, 1302	6	ENGL 1301, 1302	6	ENGL 1301, 1302	6
Mathematics	6	Mathematics	6	Mathematics	6	Mathematics	6
P.E., Band, or ROTC	2	P.E., Band, or ROTC	2	P.E., Band, or ROTC	2	P.E., Band, or ROTC	2
SECOND YEAR							
BIOL 2100	1	BIOL 2100	1	MBIO 2100	1	BIOL 2100	1
BIOL 3102	1	BIOL 3102	1	MBIO 3301	3	BIOL 3102	1
BIOL 3301	3	BIOL 3301	3	CHEM 3105, 3106	2	BIOL 3301	3
Org. Chem.	4-8	Org. Chem.	4-8	CHEM 3305, 3306	6	Org. Chem.	4-8
†ENGL 2301, 2302	6	†ENGL 2301, 2302	6	†ENGL 2301, 2302	6	†ENGL 2301, 2302	6
‡For. Lang.	6-8	‡For. Lang.	6-8	‡For. Lang.	6-8	‡For. Lang.	6-8
Major, minor, or ##electives	8-14	Major, minor, or ##electives	8-14	Major, minor, or ##electives	9-12	Major, minor, or ##electives	8-14
THIRD AND FOURTH YEARS							
For. Lang.	6	BIOL 3420	4	MBIO 3401	4	BIOL 3420	4
#HIST 2300, 2301	6	For. Lang.	6	MBIO 3420	4	For. Lang.	6
PHYS 1306, 1307	6	#HIST 2300, 2301	6	MBIO 4303	3	#HIST 2300, 2301	6
PHYS 1103, 1104	2	PHYS 1306, 1307	6	For. Lang.	6	PHYS 1306, 1307	6
POLS 2301, 2302	6	PHYS 1103, 1104	2	#HIST 2300, 2301	6	PHYS 1103, 1104	2
Major, minor, or electives	22-34	POLS 2301, 2302	6	PHYS 1306, 1307	6	POLS 2301, 2302	6
		Major, minor, or electives	25-37	PHYS 1103, 1104	2	Major, minor, or electives	25-37
				POLS 2301, 2302	6		
				Major, minor, or electives	20-25		
Total hours required	126		126		126		126

**See chemistry prerequisites.
†See college requirements.
‡See foreign language requirements.
#Any U.S. history course will satisfy this requirement.
##6 hours of nonscience, nonmathematics electives are required.

Students majoring in biology, botany, microbiology, or zoology must complete PHYS 1306, 1103, 1307, 1104 or PHYS 1308, 1105, 2301, 1106.

Courses with a grade of D cannot be counted toward fulfillment of requirements for a major or minor in any program in this department.

Suggested sequence of courses for the Bachelor of Science degree programs in biology, botany, microbiology, and zoology are set forth in the accompanying table.

Teacher Education. Students completing the Bachelor of Arts or the Bachelor of Science degree, together with the special requirements for teacher certification, including required courses in professional education and in two teaching fields, will be qualified to teach biology in the public schools of Texas. Chemistry, physics, or mathematics is recommended as a second teaching field.

Students using biology as a teaching field for the degree of Bachelor of Science in Education must take the following courses: BIOL 1401 or 1403, 1402 or 1404, 3301; MBIO 3400; ZOOL 2403; and three of the five following courses: BIOL 3420; BOT 3303, 3304; ZOOL 3406, 4307.

Students may elect a broadfield science teaching plan. Under this plan a student must complete a minimum of 50 semester hours in the science departments; 18 of these hours must be above the sophomore level. Students following this plan who wish a concentration in the Department of Biological Sciences must complete the following courses: BIOL 1401 or 1403, 1402 or 1404; CHEM 1305 or 1307, 1306 or 1308, 1101 or 1103, 1102 or 1104; GEOL 1303, 1304, 1101, 1102; PHYS 1306, 1103, 1307, 1104; BIOL 3301, MBIO 3400; and 11 semester hours of junior or senior rank in biology, chemistry, or physics.

Elementary education majors may complete a specialization in biology. Course options and requirements are available from the student's academic advisor in the College of Education.

Courses in Biology. (BIOL)

BIOL 1401 or 1403 plus BIOL 1402 or 1404 will satisfy the laboratory science requirements for Arts and Sciences and fulfill all introductory biology prerequisites for other courses in the Department of Biological Sciences. Of these courses only one plant course and one animal course may be counted for credit.

1401. Biology of Plants (4:3:3). An introductory coverage of plant-environment interactions and plant structure and function as they relate to our understanding of the plant world. Recommended for students not majoring in biology. Will fulfill laboratory science requirements. BIOL 1401 and 1402 may be taken in any sequence or simultaneously.

1402. Biology of Animals (4:3:3). An introductory coverage of animal-environment interactions and animal structure, function, and behavior as they relate to our understanding of the animal world. Recommended for students not majoring in biology. BIOL 1401 and 1402 may be taken in any sequence or simultaneously.

1403. Principles of Botany (4:3:3). A coverage of the structure, function, diversity, and ecology of plants designed to provide a more thorough background in principles and concepts than BIOL 1401. Recommended for students majoring in the biological sciences and related disciplines.

1404. Principles of Zoology (4:3:3). A coverage of the structure, function, behavior, diversity, and ecology of animals designed to provide a more thorough background in principles and concepts than BIOL 1402. Recommended for students majoring in the biological sciences and related disciplines.

2100. The Laboratory Experience (1:0:3). An introductory course in instrumentation, techniques, and methodology commonly used in biological laboratories; considerable exposure to the scientific method.

2300. Field Biology (3:2:2). Prerequisite: Four hours of biology or consent of instructor. The study of natural populations of plants and animals including their identification, behavior, and ecology especially as affected by human activities. Regular field trips. Not for major credit.

2305. Evolution (3:3:0). Prerequisite: Four hours of biology or consent of instructor. A basic evolution course for the nonscientist. Not for major credit.

2306. Biological Status of Man (3:3:0). A current topics course covering genetic counseling, amniocentesis, recombinant DNA, cancer, organ transplantation, and aging mechanisms. Not for major credit.

3102. Experimental Genetics (1:0:3). Prerequisite: One year of introductory biology; prerequisite or parallel: BIOL 3301. A survey of the techniques of experimental inquiry of the materials, methods, and the terminology used in genetics.

3103. Field Aspects of Bioecology (1:0:3). Prerequisite: One year of introductory biology; BIOL 3303 or equivalent, must be taken parallel or as a prerequisite. An optional laboratory course to accompany BIOL 3303 for those students who need or desire field experience.

3301. Genetics (3:3:0). Prerequisite: One year of introductory biology. Genetic principles with emphasis on mechanisms and problem solving.

3302. Developmental Biology (3:2:3). Prerequisite: Introductory biology and genetics. A synthesis of animal and plant development, stressing the basic principles of molecular, cellular, and organismic development.

3303. Bioecology (3:3:0). Prerequisite: One year of introductory biology or consent of instructor. Introduction to the relationship of organisms to their environment.

3304. Human Genetics (3:3:0) Prerequisite: One year of introductory biology or consent of instructor. A study of the frequency and transmission of human genetic and chromosomal mutations and the application of this information to individual cases.

3307. Population Biology (3:3:0). Prerequisite: BIOL 3301 required; BIOL 3303 recommended. Introduction to population biology theory with emphasis on interaction between genetics and ecology.

3311. Marine Biology (3:3:0). Prerequisite: One year of introductory biology; CHEM 1307, 1308 or equivalent; ZOOL 3406 recommended. An introduction to physical and chemical factors affecting marine life and a consideration of the various communities of marine organisms. Optional field trip to University of Texas Marine Institute.

3312. Coral Reef Biology (3:2:3). Prerequisite: BIOL 1402 or 1404 or equivalent; scuba certification. Reef ecology and biology of important reef animals. Classroom instruction and observation of coral reef and turtle grass communities. Taught in late May at Key Largo, Florida.

3406. Cell and Tissue Culture (4:2:4). Prerequisite: BIOL 3420 or MBIO 3401 or consent of instructor. An introduction to the principles and methods of in vitro cell culture.

3420. Cell Biology (4:3:3). Prerequisite: BIOL 3301 and one semester of organic chemistry. An integrated study of the basic principles of cell structure and function.

4100. Undergraduate Research in Biology (1). Prerequisite: 15 hours of biology, junior or senior standing, and consent of instructor. Selected research problems according to the needs of the students. May be repeated or taken parallel for credit in another field or with new materials in the same field.

4101. Biology Seminar (1:1:0). Prerequisite: Senior standing in biology, botany, or zoology. Critical reviews of classical and recent literature and reports of original investigations. May be repeated for credit.

4102. Applications of Academic Training (1:1:0). Prerequisite: Junior or senior standing in biological sciences. Designed to aid students majoring in the biological

sciences to develop the applied skills of using their academic background in job situations.

4110. Topics in Biology (1). Prerequisite: Consent of instructor. Special areas of current interest not commonly included in other courses. Content normally different each time offered. May be repeated for credit up to 3 hours.

4300. Undergraduate Research in Biology (3). Prerequisite: 15 hours of biology, junior or senior standing in biology, and consent of instructor. Selected research problems according to the needs of the students. May be repeated or taken parallel for credit in another field or with new materials in the same field.

4301. Topics in Biology (3). Prerequisite: Consent of instructor. Special areas of current interest not commonly included in other courses. Content normally different each time offered. May be repeated for additional credit.

4304. Biological Chemistry Laboratory (3:1:6). Prerequisite: CHEM 4306. General laboratory course concentrating on contemporary biochemical techniques for the isolation, purification, and characterization of the biomolecular species.

4305. Organic Evolution (3:3:0). Prerequisite: BIOL 3301 or equivalent course in genetics. The principles and processes of evolution and how they relate to the ecology, physiology, behavior, morphology, and systematic classification of organisms.

4307. Biological Chemistry II (3:3:0). Prerequisite: CHEM 4306. Second semester of a two-semester course in general biochemistry.

4309. Biology of Inland Waters (3:2:3). Prerequisite: One year of introductory biology; CHEM 1307, 1308, 1101, 1102. Introduction to the biology of streams, ponds, reservoirs, and wetlands with particular emphasis on ecological principles and laboratory recognition and identification of major groups of vascular plants, algae, and invertebrates exclusive of insects.

4310. Introduction to Virology (3:3:0). Prerequisite: BIOL 3420 or MBIO 3401 or consent of instructor. An introduction to basic concepts in the structure, replication, and ecology of viruses from animals (including insects), plants, and procaryotes.

Courses in Botany. (BOT)

2306. Plants and Man (3:3:0). A nontechnical course designed to give broad coverage of human dependence on and use of plants including medicinal, edible, hallucinogenic, and other culturally important plants. Not for major credit.

3302. Plant Pathology (3:2:3). Prerequisite: One year of introductory biology; prerequisite or parallel, MBIO 3400 or equivalent. Principles underlying the cause, identification, and control of plant diseases.

3303. Plant Morphology (3:2:3). Prerequisite: Introductory botany. The form and reproduction of plants. Field trips may be required.

3304. Taxonomy of the Flowering Plants (3:2:3). Prerequisite: One year of introductory biology. Principles and practices in classification of flowering plants. Field trips required.

3309. Plant Anatomy (3:2:3). Prerequisite: Introductory botany. A basic account of the cells, tissues, and organs of flowering plants with emphasis placed on evidence obtained from modern experimental studies. Laboratory emphasis on microtechnique using the rotary microtome.

3401. Plant Physiology (4:3:3). Prerequisite: Introductory botany and one year of college chemistry. The physiology of plants with an emphasis on relationships of structure to function in vascular plants.

4303. Plant-Water Relationships (3:3:0). Prerequisite: BOT 3401 or consent of instructor. Properties of water and solutions, cell water relations, soil water, soil-root interfaces, water and salt absorption, translocation and transpiration. Emphasis on the understanding of water deficits developed under arid conditions.

4306. Plant Geography (3:3:0). Prerequisite: One year of introductory biology or consent of instructor. Principles of the geography of plants; vegetation types, especially of North America. Occasional field trips.

4308. Morphology of Fungi (3:2:3). Prerequisite: One year of introductory biology. Morphology as a basis for the classification of the fungi.

Courses in Entomology. (ENTO)

4302. Medical Entomology (3:2:3). The study of human diseases caused by arthropods and disease agents transmitted by arthropods.

Courses in Microbiology. (MBIO)

2100. The Laboratory Experience (1:0:3). An introductory course in instrumentation techniques and methodology commonly used in biological laboratories; considerable exposure to the scientific method. Same as BIOL 2100. Only BIOL 2100 or MBIO 2100 may be counted for credit.

2300. Microbes and Human Affairs (3:3:0). Desirable and undesirable activities of microbes as they affect humans; biotechnological application of microbial activities include the production of food, beverage, and pharmaceutics.

3102. Experimental Genetics (1:0:3). Prerequisite: One year of introductory biology; prerequisite or parallel: BIOL 3301 or MBIO 3301. A survey of the techniques of experimental inquiry of the materials, methods, and the terminology used in genetics. Same as BIOL 3102. Only BIOL 3102 or MBIO 3102 may be counted for credit.

3300. Public Health Microbiology (3:3:0). Prerequisite: A course in microbiology. The history and epidemiology of infectious diseases and the developments leading to control of human diseases important in public health. Not for major or minor credit.

3301. Genetics (3:3:0). Prerequisite: One year of introductory biology. Principles of heredity with special reference to practical application in human affairs, heredity mechanisms, and problems. Same as BIOL 3301. Only BIOL 3301 or MBIO 3301 may be counted for credit.

3303. Parasitology (3:2:2). Prerequisite: Junior or senior standing in microbiology; introductory zoology or equivalent. Morphology, life cycles, and physiology of protozoan and helminth parasites, with emphasis on broad aspects of parasitism and examples with medical and economic interest. Same as ZOOL 3303. Only ZOOL 3303 or MBIO 3303 may be counted for credit.

3400. Microbiology (4:3:4). Prerequisite: 3 hours of biology. Morphology, physiology, and activities of bacteria, molds, and viruses. Primarily for students of agriculture, secondary education, home economics, nursing, and others seeking an advanced science elective.

3401. Principles of Microbiology (4:3:4). Prerequisite: One year of introductory biology; prerequisite or parallel: CHEM 3305 and 3306. Morphology, physiology, and classification of microorganisms.

3406. Cell and Tissue Culture (4:2:4). Prerequisite: MBIO 3401 or BIOL 3420, or consent of instructor. An introduction to the principles and methods of *in vitro* cell culture.

3420. Cell Biology (4:3:3). Prerequisite: BIOL 3301 and one semester of organic chemistry. An integrated study of the basic principles of cell structure and function. Same as BIOL 3420. Only MBIO 3420 or BIOL 3420 may be counted for credit.

4101. Microbiology Seminar (1:1:0). Prerequisite: Senior standing in microbiology. Critical reviews of classical and recent literature and reports of original investigations. May be repeated for credit.

4102. Applications of Academic Training (1:1:0). Prerequisite: Junior or senior standing in microbiology. Designed to aid students majoring in the biological sciences to develop the applied skills of using their academic background in job situations. Same as BIOL 4102. Only MBIO 4102 or BIOL 4102 may be counted for credit.

4303. Physiology of Bacteria (3:3:0). Prerequisite: MBIO 3401; 12 hours of chemistry. Chemistry and physiology of bacteria and related microorganisms.

4306. The Genetics of Bacteria and Their Viruses (3:3:0). Prerequisite: BIOL 3301 or MBIO 3301, MBIO 3401, or consent of instructor. The principles of genetic systems existing among bacteria and bacteriophages.

4307. Industrial Microbiology (3:3:0). Prerequisite: MBIO 3401. An introduction to fermentation techniques, food microbiology, production of various microbial products, microbial transformations, sewage disposal, and microbiological control.

4308. Morphology of the Fungi (3:2:3). Prerequisite: One year of introductory biology. Morphology as a basis for the classification of the fungi. Same as BOT 4308. Only BOT 4308 or MBIO 4308 may be counted for credit.

4309. Medical Mycology (3:2:3). This course is concerned with medically important fungi and the mycoses caused by these organisms. Laboratory sessions will emphasize identification methods.

4310. Introduction to Virology (3:3:0). Prerequisite: MBIO 3401 or BIOL 3420 or consent of instructor. An introduction to basic concepts in the structure, replication, and ecology of viruses from animals (including insects), plants, and procaryotes.

4311. Medical Entomology (3:2:3). The study of human diseases caused by arthropods and disease agents transmitted by arthropods. Same as ENTO 4302. Only ENTO 4302 or MBIO 4311 may be counted for credit.

4323. Experimental Microbial Physiology (3:0:9). Prerequisite or parallel: MBIO 4303. The application of experimental techniques to the study of microbial physiology.

4400. Practicum in Applied Microbiology (4:0:12). Practical experience in affiliated governmental, industrial, and medical microbiology laboratories. May not be repeated for credit. Not for major or minor credit.

4402. Immunology and Serology (4:3:4). Prerequisite: MBIO 3401 or BIOL 3420; 10 hours of chemistry. Theories of infection and resistance, the production and demonstration of antibodies, the action of antigens, and diagnostic tests.

4404. Pathogenic Microbiology (4:3:4). Prerequisite: MBIO 3401. A detailed study of pathogenic microorganisms. Laboratory procedures in the isolation and identification of etiological agents.

Courses in Medical Technology. (M TE)

4205. Serology (2). Prerequisite: Completion of medical technology requirements. Hospital practicum in the study of numerous immune responses and the demonstration of antigen-antibody reactions.

4206. Urinalysis (2). Prerequisite: Completion of medical technology requirements. Hospital practicum in the study of urine as a body fluid, including assays of hormones and other products eliminated by the kidneys.

4401. Blood Bank and Blood Services (4). Prerequisite: Completion of medical technology requirements. Hospital practicum in the study of principles of blood grouping, Rh typing, and compatibility testing of blood transfusions and component therapy. Tests for detection of antibodies are performed.

4402. Clinical Chemistry I (4). Prerequisite: Completion of medical technology requirements. Hospital practicum in the study of the chemical composition of body fluids, employing both manual and automated procedures for routine and special tests. Emphasis is on disease states.

4403. Clinical Chemistry II (4). Prerequisite: Completion of medical technology requirements. Hospital practicum in the study of the chemical composition of body fluids, employing both manual and automated procedures for routine and special tests. Emphasis is on disease states.

4404. Clinical Microbiology I (4). Prerequisite: Completion of medical technology requirements. Hospital practicum in the isolation and identification of microorganisms and their relationship to diseases in man.

4405. Clinical Microbiology II (4). Prerequisite: Completion of medical technology requirements. Hospital practicum in the isolation and identification of microorganisms and their relationship to diseases in man.

4603. Hematology and Coagulation (6). Prerequisite: Completion of medical technology requirements. Hospital practicum in the study of the normal and pathologically formed elements of the blood and blood forming tissues and of the normal and disease states in coagulation.

Courses in Zoology. (ZOOL)

2403. Human Anatomy and Physiology I (4:3:3). Prerequisite or parallel: 6 hours of chemistry recommended. Structure and function of cells and body systems. Open to students in home economics, medical technology, microbiology, physical education, prenursing, and to students in the biology teaching field.

2404. Human Anatomy and Physiology II (4:3:3). Prerequisite: ZOOL 2403. For students who wish to study in more depth some of the topics covered in ZOOL 2403. Emphasis will be in physiology and its relationship to disease.

2405. Vertebrate Structure and Development (4:3:3). Prerequisite: Introductory zoology. The comparative study of vertebrate structure and embryological development.

2406. Comparative Anatomy of Game Animals. (4:3:3). Prerequisite: BIOL 1402 or 1404 or equivalent. A comparative study of game and other wild animals, with emphasis on embryology, functional anatomy, and evolution. Not for major or minor credit in the biological sciences.

3303. Parasitology (3:2:3). Prerequisite: Introductory zoology or equivalent. Morphology, life cycles, and physiology of protozoan and helminth parasites, with emphasis on broad aspects of parasitism and examples with medical and economic interest.

3309. Biology of Fishes (3:2:3). Prerequisite: Introductory zoology or sophomore standing in wildlife management. An introduction to the classification, structure, natural history, and identification of fishes, with emphasis on freshwater species of Texas. Local field trips.

3401. Animal Histology (4:2:6). Prerequisite: ZOOL 2405. The study of normal tissues of the human and other mammals. An introductory course recommended for students of pathology, medical sciences, and biomedical sciences.

3406. Comparative Invertebrate Zoology (4:3:3). Prerequisite: One year of introductory biology or consent of instructor. Structure, life history, and evolution of the invertebrates. Optional field trip to University of Texas Marine Institute.

4203. Principles of Neurophysiology (2:2:0). Prerequisite: Senior standing in zoology or consent of instructor. Consideration of the properties of excitable cells in invertebrates and vertebrates. Topics to be considered include reception, excitation, conduction, transmission, integration, contraction, and simple behaviors.

4304. General Endocrinology (3:3:0). Prerequisite: BIOL 3420 or ZOOL 4409, organic chemistry. Hormones as chemical coordinators of bodily functions.

4306. Introduction to Mammalogy (3:2:3). Prerequisite: Introductory zoology or junior standing in wildlife management; ZOOL 4307 recommended. Study of the classification, natural history, and history of mammals. Local field trips.

4307. Natural History of the Vertebrates (3:2:3). Prerequisite: One year of introductory biology or consent of instructor. Habits, life history, and ecology of vertebrates. Local fauna will be studied. Local and overnight field trips.

4308. General Ornithology (3:2:3). Prerequisite: Junior standing. Emphasis on laboratory and field work in systematics, ecology, and anatomy of birds. Local field trips.

4312. Animal Behavior (3:3:0). Comparative study of animal behavior; its genetic basis, expression through neurophysiological mechanisms, function in the environment, and adaptive role during evolutionary history.

4409. Comparative Animal Physiology (4:3:3). Prerequisite: ZOOL 2405 or 3406, CHEM 1307, 1308; BIOL 3420 recommended. A comparison of physiological functions of animals in the major phyla.

Department of Chemistry

Professor Richard A. Bartsch, Chairperson; Associate Professor Robert A. Holwerda, Associate Chairperson.
Horn Professors Shine and Song; Welch Professor Robinson; Professors Anderson, Guerrant, Kice, Knaff, Mills, Redington, and Wilde; Associate Professors Adamcik, Armstrong, Draper, Larsen, Marx, McPherson, Mitchell, and Rekers; Assistant Professors Chesnavich, Dasgupta, Shaw, and Walkup.

This department supervises the following degree programs: CHEMISTRY, *Bachelor of Arts* or *Bachelor of Science, Master of Science,* and *Doctor of Philosophy.* Those students seeking graduate degrees may major in analytical, inorganic, organic, or physical chemistry or biochemistry.

The undergraduate student may take courses leading to a Bachelor of Arts or a Bachelor of Science degree. Either program offers a wide choice of minor subjects, not only in the College of Arts and Sciences, but in the other colleges as well. Thus, to the areas of biology, geology, mathematics, and physics traditionally associated with chemistry as suitable minors are added such compatible subjects as chemical engineering, computer science, economics, environmental studies, industrial engineering, textile engineering, business, agricultural economics, soil science, food and nutrition, and secondary education, among others. It is necessary that the student interested in these or other minors, especially those outside the College of Arts and Sciences, consult an undergraduate advisor in the Department of Chemistry prior to registration for a particular minor program.

Completion of the B.S. curriculum outlined below leads to automatic certification as a professional degree by the American Chemical Society.

Advanced Standing. The Chemistry Department will permit a student to receive credit for any courses in the curriculum if proficiency is demonstrated in that area by examination. Examinations for beginning (first-year) courses will be given at 1:30 p.m. on the first day of regular registration each semester in room 101 of the Chemistry Building. Previous registration for these examinations is not required of students entering Texas Tech for the first time. Students who have previously been enrolled here must apply to the Dean of the College of Arts and Sciences for approval to take the examination. For all other courses, after having received approval from the Dean of the College of Arts and Sciences, it will be the responsibility of the student to petition the department chairperson for such examination(s) well before normal enrollment in the course.

Chemistry Curriculum, B.S. Degree.

FIRST YEAR

Fall		*Spring*	
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	CHEM 1104, Prin. of Chem. II (Lab.)	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
American History	3	American History	3
*MATH 1351, Calculus I	3	MATH 1352, Calculus II	3
**Science elect.	4	**Science elect.	4
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	18		18

SECOND YEAR

Fall		*Spring*	
CHEM 3305, Org. Chem. Lect. I	3	CHEM 3306, Org. Chem. Lect. II	3
CHEM 3205, Org. Chem. Lab. I	2	CHEM 3206, Org. Chem. Lab. II	2
GERM 1401, Beg. German I	4	†Computer sci. elect.	3
MATH 2350, Calculus III	3	GERM 1402, Beg. German II	4
PHYS 1308, Prin. of Physics I	3	PHYS 2301, Prin. of Physics II	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	PHYS 1106, Prin. of Phys. II (Lab.)	1
	16		16

THIRD YEAR

Fall		*Spring*	
CHEM 2501, Analyt. Chem.	5	CHEM 3308, Phys. Chem. II	3
CHEM 3307, Phys. Chem. I	3	CHEM 3108, Phys. Chem. Lab. II	1
CHEM 3107, Phys. Chem. Lab. I	1	CHEM 4412, Instr. Analysis	4
ENGL 2309 or 3365, Tech. Writing	3	ENGL 2301 or 2302, Mast. of Lit.	3
GERM 2303, Sci. German I	3	GERM 2304, Sci. German II	3
Minor	3-4	Minor	3-4
	18-19		17-18

FOURTH YEAR

Fall		*Spring*	
CHEM 4105, Inorg. Chem. Lab.	1	Free elective	3
CHEM 4305, Inorg. Chem.	3	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3	Minor	0-6
Minor	3	Free elective	3
‡Senior elective (chemistry)	3-6	‡Senior elective (chemistry)	3-6
	13-16		12-18

TOTAL 131-138

*Adequate training in algebra, trigonometry, and analytic geometry is a prerequisite for calculus. The student in doubt about which mathematics courses to take in the first year must consult with an undergraduate departmental advisor.

**The science elective must be either BIOL 1401 (Botany) and BIOL 1402 (Zoology) or GEOL 1303, 1101 (Physical Geology) and GEOL 1304, 1102 (Historical Geology).

†The computer science elective — probably C S 1302 — will be chosen with the help of an undergraduate departmental advisor.

‡Three electives chosen from CHEM 4000 (up to 3 hours), 4302, 4303, 4308, 4309.

Chemistry Curriculum, B.A. Degree.

This curriculum is primarily designed for the student who is interested in using an undergraduate major in chemistry as the background for a career in such fields as medicine, dentistry, environmental protection, clinical and pharmacological chemistry, technical sales, chemical patent law, etc., where quite extensive undergraduate training in chemistry is either valuable or essential. It also provides a

sufficient background in chemistry so that a student upon graduation can seek employment as a chemist in an industrial laboratory or enter a graduate program leading to the M.S. or Ph.D. degree in chemistry.

CHEM 1307, 1308 (or 1305, 1307, 1308), 1103, 1104, 2401, 3305, 3306, 3105, 3106, 3307, 3107, 4412, and 6 hours to be chosen from 3308, 3108, 4302, 4303, 4305, 4105, 4306, 4307, 4308, and 4309	34 hours
MATH 1350 (if needed), 1351, 1352	6 hours
PHYS 1306, 1307 (or 1308, 2301) and 1103, 1104 (or 1105, 1106)	8 hours
English	12 hours
HIST 2300, 2301	6 hours
POLS 2301, 2302	6 hours
Social science	6 hours
Humanities	6 hours
Fine arts	6 hours
Foreign language	6-14 hours
P.E., Band, or ROTC	2 hours
Minor requirements and free electives to total a minimum of	125 hours

By modifying this program slightly and taking 9 more semester hours of chemistry and one additional course each in mathematics and computer science, students in the B.A. curriculum can also meet the requirements for certification upon graduation by the American Chemical Society as holders of a professional degree in chemistry. (This is the same certification given automatically to all those who complete the B.S. curriculum.) The following course program should be taken if certification is desired upon completion of the B.A. curriculum.

CHEM 1307, 1308 (or 1305, 1307, 1308), 1103, 1104, 2501, 3305, 3306, 3205, 3206, 3307, 3308, 3107, 3108, 4305, 4105, 4412, and 3 hours to be chosen from 4000 (up to 3 hours), 4302, 4303, 4308, and 4309	42 hours
MATH 1350 (if needed), 1351, 1352, and 2350	9 hours
Computer Science elective (C S 1302)	3 hours

All other requirements are exactly the same as outlined for the regular B.A. curriculum in chemistry.

Teacher Education. Students seeking a provisional certificate with chemistry as a teaching field may satisfy the requirement in chemistry through any one of five degree plans. The courses needed for a B.A. or B.S. major in chemistry provide much more than the required minimum of 24 semester hours with at least 12 hours at the advanced level. However, for the B.A. or B.S. with a major other than chemistry, and for the B.S. in Education, either of the following sequences of courses will be adequate to meet this requirement, since training in four fields of chemistry and 12 advanced hours out of a total of 25 semester hours are provided:

CHEM 1307, 1308 (or 1305, 1307, 1308); 1103, 1104; 2401; 3401; and 3307, 3308, 3107, 3108 or

CHEM 1307, 1308 (or 1305, 1307, 1308); 1103, 1104; 2401; 3307, 3107; and 3305, 3306, 3105, 3106 (or 3205, 3206).

In both sequences, calculus (MATH 1351, 1352 or equivalent) and 8 hours of physics are prerequisite to the physical chemistry courses CHEM 3307 and 3308. Other combinations of advanced courses are possible, and can be arranged with the help of the department's teacher certification advisor, such as substituting CHEM 3402 or 4306, 4307 for CHEM 3307, 3107 in the second sequence. Additional requirements for teacher certification will be found in the Teacher Education section of this catalog.

(Note: CHEM 3401 and 3402 do not serve as adequate background for graduate majors and minors in chemistry.)

Courses in Chemistry. (CHEM)

1101. Experimental General Chemistry I (Laboratory) (1:0:3). At the time of registration the student must be registered (or have credit) for CHEM 1305. This course is designed to introduce the student to a variety of laboratory techniques and to complement the lecture course CHEM 1305.

1102. Experimental General Chemistry II (Laboratory) (1:0:3). Prerequisite: CHEM 1101 and CHEM 1305. At the time of registration the student must be registered (or have credit) for CHEM 1306. CHEM 1102 is a continuation of CHEM 1101.

1103. Principles of Chemistry I (Laboratory) (1:0:3). Prerequisite: CHEM 1307 or concurrent enrollment. Introduction to a wide variety of experimental techniques.

1104. Principles of Chemistry II (Laboratory) (1:0:3). Prerequisite: CHEM 1103 and 1307; concurrent enrollment or credit in CHEM 1308. A continuation of CHEM 1103 that serves as a prerequisite for all advanced laboratory courses in chemistry.

1305. Essentials of Chemistry I (3:3:0). A survey of chemistry including the basic theories as well as the properties of substances. This course is designed for students whose professional objectives do not require a more intensive training in the quantitative aspects of chemistry. The course, along with CHEM 1306, 1101 & 1102, will satisfy the laboratory science requirement of all students except those whose majors and interests require CHEM 1307 and 1308. For students who have not had high school chemistry, CHEM 1305 (without CHEM 1101 laboratory) is a prerequisite for CHEM 1307.

1306. Essentials of Chemistry II (3:3:0). Prerequisite: CHEM 1305. A continuation of CHEM 1305. Emphasis will be placed on some aspects of organic chemistry and biochemistry, and on topics of current interest.

1307. Principles of Chemistry I (3:3:0). Prerequisite: High school chemistry or CHEM 1305 and a facility with elementary algebra. A study of the fundamental principles of chemistry designed particularly for students who plan careers in the physical or biological or related sciences, premedical studies, and engineering.

1308. Principles of Chemistry II (3:3:0). Prerequisite: CHEM 1307. A continuation of CHEM 1307 that will serve as a prerequisite for most of the more advanced chemistry courses.

2401. Analytical Chemical Methods (4:3:3). Prerequisite: CHEM 1307, 1103, 1308, 1104. A general course in analytical chemical methods emphasizing practical applications including techniques important to the biological and medical sciences.

2501. Analytical Chemistry (5:3:6). Prerequisite: CHEM 1307, 1308, and 1103, 1104. Basic course in the theories and techniques of analytical chemical methods.

Required of all chemistry majors pursuing an American Chemical Society certified professional degree plan.

3000. Undergraduate Research (V1-6). Prerequisite: Consent of instructor. Individual research project under the guidance of a member of the staff. May be repeated for credit.

3105, 3106. Organic Chemistry Laboratory (1:0:3 each). Prerequisite: CHEM 1307, 1308, and 1103, 1104; parallel registration in CHEM 3305, 3306 required. CHEM 3105 (or 3205) is prerequisite to CHEM 3106. Fundamental techniques of organic chemistry.

3107. Physical Chemistry Laboratory I (1:0:3). Prerequisite: Credit for or concurrent registration in CHEM 3307. An introduction to physical chemical experimental methods including calorimetry, phase equilibria, surface phenomena, and viscosity.

3108. Physical Chemistry Laboratory II (1:0:3). Prerequisite: CHEM 3307 and credit for or concurrent enrollment in CHEM 3308. CHEM 3107 and 3108 may be taken concurrently. An introduction to physical chemical methods including spectroscopy, high-vacuum techniques, electric and magnetic phenomena.

3205, 3206. Organic Chemistry Laboratory (2:0:6 each). Prerequisite: CHEM 1307, 1308, and 1103, 1104; parallel registration in CHEM 3305, 3306 required. CHEM 3205 (or 3105) is prerequisite to CHEM 3206. Techniques of preparative organic chemistry. Required for chemistry majors.

3305, 3306. Organic Chemistry (3:3:0 each). Prerequisite: CHEM 1307, 1308, and 1103, 1104; parallel registration in CHEM 3105, 3106, or 3205, 3206 required. CHEM 3305 is prerequisite to CHEM 3306. A thorough foundation course in organic chemistry. Prerequisite for all courses in organic chemistry above the junior level.

3307. Physical Chemistry I (3:3:0). Prerequisite: CHEM 1307, 1308, 1103, 1104; PHYS 1306, 1103, 1307, 1104 or 1308, 1105, 2301, 1106; MATH 1351, 1352, or equivalent. The study of gases, kinetic theory, thermodynamics, chemical and phase equilibria, and solutions.

3308. Physical Chemistry II (3:3:0). Prerequisite: CHEM 3307. The study of chemical kinetics, electrochemistry, transport properties, surface chemistry, quantum chemistry, and statistical mechanics.

3401. Introductory Organic Chemistry (4:3:3). Prerequisite: Freshman chemistry with laboratory. A brief study of the compounds of carbon for students in agriculture, home economics, and other fields who require an introduction to the subject. Not open to majors in chemistry or chemical engineering for credit.

3402. Physiological Chemistry (4:3:3). Prerequisite: CHEM 3401. An elementary course in physiological chemistry. Not open to majors in chemistry or chemical engineering for credit.

4000. Senior Research (V1-6). Prerequisite: Senior standing, 2.5 GPA in previous chemistry courses and consent of instructor. Individual research project under the guidance of a member of the staff. The project will be at a more advanced level than is involved in CHEM 3000. The student is required to make use of the chemical literature in the planning of the research and to submit a formal report at the end of the course. May be repeated for credit.

4105. Inorganic Chemistry Laboratory (1:0:3). Prerequisite: Credit for or concurrent registration in CHEM 4305. Techniques used in synthesis and characterization of inorganic compounds: complex ion synthesis, vacuum-line techniques, chromatography, inert atmosphere preparations, spectroscopy of inorganic compounds.

4302. Structure and Mechanisms in Organic Chemistry (3:3:0). Prerequisite: CHEM 3305, 3306, and 3105, 3106, or 3205, 3206, and 3307. Organic chemistry at an advanced level. Emphasis on developments in theoretical organic chemistry.

4303. Molecular Biochemistry I (3:3:0). Prerequisite: CHEM 3305, 3306, 3105, 3106 or 3205, 3206; 3307 and 3308. Molecular descriptions of biological materials and systems.

4305. Inorganic Chemistry (3:3:0). Prerequisite: CHEM 3307. A survey of modern topics in inorganic chemistry, including coordination compounds, acid-base chemistry, periodicity, transition elements, and inorganic rings, cages, and chains.

4306, 4307. Biological Chemistry I and II (3:2:3 each). Prerequisite: CHEM 3305, 3306, 3105, 3106, or 3205, 3206. Chemistry of constituents of living systems. Regulation of process of living organisms.

4308. Physical Chemistry III (3:3:0). Prerequisite: CHEM 3307, 3308 or coregistration in CHEM 3308. Advanced topics in modern physical chemistry.

4309. Inorganic Chemistry II (3:3:0). Prerequisite: CHEM 4305. A continuation of CHEM 4305 for students particularly interested in inorganic chemistry. Topics covered will include inorganic reaction mechanisms, organometallic, and bioinorganic chemistry.

4412. Instrumental Analytical Methods (4:3:3). Prerequisite: CHEM 2401 or 2501 and 3307, 3107: Theories and application of instrumental methods of chemical analysis.

Department of Classical and Romance Languages

Associate Professor Lorum H. Stratton, Chairperson.
Professors Andrews, Christiansen, Cismaru, Dietz, Finco, Garcia-Girón, George, Maxwell, Morris, H. Oberhelman, Patterson, and Pérez; Associate Professors Alexander, Bravo, Cravens, Klein, Smith, and Wood; Assistant Professors Corbett, Holland, Hopkins, Klock, and S. Oberhelman; Instructor Ballew.

This department supervises the following degree programs: *Bachelor of Arts* in FRENCH, LATIN, and SPANISH, *Master of Arts* in CLASSICAL HUMANITIES, FRENCH, and SPANISH, and *Doctor of Philosophy* in SPANISH. The department participates in the LATIN AMERICAN AREA STUDIES program at the undergraduate level as well as in the minor at the doctoral level. It also participates in the bilingual secretarial, ethnic studies, linguistic and semiotic studies, comparative literature, and teacher education programs. See the section on Special and Interdepartmental Programs of the College of Arts and Sciences.

An undergraduate major in French, Latin, or Spanish consists of 30 hours at the 2000-level and above. Specific course requirements may be obtained from departmental academic counselors.

A minor may be obtained in French, Greek, Italian, Latin, Portuguese, or Spanish. Normally a minimum of 18 hours in one language is required, including at least 3 hours at the 4000-level; however, students who present three or four units of a single foreign language from high school may enter courses in the 3000-series in the same language and complete a 12-hour minor by offering 12 hours at junior and senior levels, including at least one 4000-level course. A major or minor in a foreign language will fulfill the foreign language and humanities requirements for the Bachelor of Arts degree.

Students who wish to major or minor in one of these languages should consult the chairperson of the department for a list of counselors. A grade of at least C in all major and minor courses is required.

To fulfill the general Bachelor of Arts requirement, students must complete 6 semester hours in the same language at the sophomore level or above. A student who enrolls in the first-year sequence will have a 12-14 hour requirement.

From placement examinations administered through the department, students may earn up to 10 hours of credit in French and Spanish (1402, 2301, 2302) and up to 12 hours of credit in Latin (1301, 1302, 2301, 2302). Students other than entering freshmen must have written permission from their respective deans. For information, contact the Department of Classical and Romance Languages. The regular first and second year foreign language courses (1301 or 1401 through 2302) are sequential. Successful completion of lower-numbered courses or equivalent competency is a prerequisite for the higher-numbered courses.

Teacher Education. For purposes of certification, teaching fields are offered in French, Latin, and Spanish. The standard program requires 24-27 hours at the 2000-level and above, which must include 9 hours of 4000-level courses in the specific language. Students seeking secondary certification in French or Spanish must complete LING 4311, preferably before their student teaching, as part of the teaching field. Students seeking elementary certification must complete LING 4311 and 4335. Students seeking secondary or elementary certification and/or bilingual education endorsement should contact the departmental office for approved counselors.

Guide for Initial Enrollment. Students with no years or one year of previous study in a foreign language should normally enroll in the 1301, 1401 sequence. In FREN 1401, 1402 and SPAN 1401, 1402, students must enroll in parallel lectures and labs (section 001, lab 501, etc.).

Students with two years of previous study in a foreign language should normally enroll in the 2301 course. Spanish, French, and Latin students with two previous years of study are encouraged to take the departmental placement exam before enrolling. When there has been a time lapse since previous study or when a student feels very uncomfortable with the language, enrollment is permitted in 1301 (1401). In Spanish, there are often special sections for such students. Students should *not* enroll initially in the 1302 (1402) course.

Students with three or more years of study in a foreign language or those who have had extensive contact with the language in the target country should take the departmental exam before enrolling.

Foreign students who have graduated from secondary schools in their native country may receive credit only for courses in their native language that are numbered 4000 or above.

Spanish students who speak the language natively or who have extensive contact with the language at home, but who have had no formal study of the language, should enroll in SPAN 1303, El Espanol para el Hispano-Hablante (Spanish for the Spanish Speaker).

Courses in Classics. (CLAS)

Prerequisites for Classics courses do not involve Latin or Greek and are as follows unless otherwise specified: 1310 and 1320 — none; all 3000-level — junior standing or consent of instructor. Courses in Classics may not be counted toward the foreign language requirement.

1310. Latin and Greek Terminology (3:3:0). Analysis of English words by study of Latin and Greek roots, prefixes, and suffixes.

1320. Introduction to the Mythology of the Classical World (3:3:0). Classical myths: stories of gods, demigods, and heroes; their significance in the ancient and modern worlds. Selected readings in translation with lectures and discussions in English.

3350. Comparative Mythology (3:3:0). Classical myths, their significance in the ancient world and influence on modern literature.

Courses in Comparative Literature. (C LT)

4320. Classical and Romance Literary Masterpieces and the Cinema (3:3:0). Prerequisite: Second year of any classical or romance language or equivalent. Readings, lectures, discussions, and film presentations of literature masterpieces of the classical and romance traditions. All readings and discussions as well as visual materials in English.

Courses in English as a Foreign Language. (EFL)

1301. Conversational English for Foreign Students (3:3:0) Prerequisite: Consent of instructor. Study of English pronunciation and intonation; development of basic oral language skills; include study of idiomatic English expression.

1302. English Grammar and Composition for Foreign Students (3:3:0) Prerequisite: Consent of instructor. A review of basic English grammar; emphasizes the development of composition skills.

2302. Advanced English Composition for Foreign Students (3:3:0) Prerequisite: Consent of instructor. An advanced review of English grammar and composition; focus on writing about technical fields in English.

Courses in French. (FREN)

FREN 3301 and/or 3302, or the equivalent, are prerequisites for all literature courses in the 4000 series except where specified in the individual courses. All of these courses are conducted in French.

1305. French Pronunciation and Diction (3:3:0) Prerequisite: Open only to students in specific programs, by consent of program director and chairperson, Department of Classical and Romance Languages. An audio-lingual approach to the phonetics of the French language with the objective of correct pronunciation. Includes an introduction to the International Phonetic Alphabet. (See also GERM 1305.)

1401, 1402. A Beginning Course in French I, II (4:3:2 each).

2301, 2302. A Second Course in French I, II (3:3:0 each). Prerequisite: FREN 1401 and 1402, or two units of high school French. Readings, cultural background, conversation, and composition.

2304. Introduction to French Literature (3:3:0) Prerequisite: FREN 2301. Designed to develop reading and vocabulary skills; may be taken concurrently with FREN 2302.

3301. Contemporary France (3:3:0) Prerequisite: FREN 2301 and 2302, or equivalent. A study of major aspects of life in France today.

3302. Major French Writers (3:3:0) Prerequisite: FREN 2301 and 2302, or equivalent. A survey of major French writers.

3303. French Conversation (3:3:0) Prerequisite: FREN 2301 and 2302, or equivalent. Designed to increase vocabulary and attain oral fluency. May be taken concurrently with FREN 3301 or 3302.

4300. Individual Problems in French (3). Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Independent work under the guidance of a staff member. Prerequisite: FREN 2301 and/or 2304, together with consent of instructor and department chairperson.

4302. Advanced Grammar and Composition (3:3:0) Prerequisite: Review of important grammatical constructions and idioms, with written practice.

4303. Advanced French Conversation (3:3:0) Prerequisite: FREN 3303. Designed to increase fluency in the spoken language.

4304. Commercial French (3:3:0). Oral and written French, with special attention to idiomatic expressions currently in use in business and technical fields.

4305. Theme et Version (3:3:0). Translation of representative French and English texts, both technical and literary.

4306. Phonetics and Diction (3:3:0). Theory and practice of the principles of pronunciation and intonations. Individual laboratory exercises.

4310. A Survey of French Literature I (3:3:0) A survey of the major French literary works from the *Song of Roland* to 1800.

4313. A Survey of Nineteenth and Twentieth Century French Literature (3:3:0). Prerequisite: FREN 3301. Readings of selected authors and works from Lamartine to Ionesco.

4314. French Drama and Poetry (3:3:0). Readings of selected dramas and/or poetry. Content will vary to meet the needs of students.

4315. The French Short Story (3:3:0). This course will trace the development of the French short story from Voltaire's *Candide* to Boris Vian's *Les Lurettes Furreés.*

4316. Contemporary Theater and Anti-Theater (3:3:0). A study of French plays and anti-plays from the post-World War II period to date.

4317. Theory and Practice of French Drama (3:3:0) Prerequisite: FREN 2302 and consent of instructor. Intensive analysis of several plays, with emphasis on problems of staging: stress on French pronunciation and conversational expressions; one public performance. May *not* be repeated for credit.

4322. Civilisation Francaise: French Civilization (3:3:0). A survey of French civilization from the Middle Ages to the present: literature, art, music, philosophy, science, and architecture. Readings, slides, films, and tapes. Conducted in French. Prerequisite: FREN 2301, 2302, or equivalent.

Courses in Greek. (GRK)

1301, 1302. A Beginning Course in Greek I, II (3:3:0 each).

2301, 2302. A Second Course in Greek I, II (3:3:0 each). Prerequisite: GRK 1301 and 1302, or equivalent. Review; selected readings from standard authors.

4300. Individual Problems in Greek (3). Prerequisite: GRK 2301 and 2302 or equivalent. Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor. Independent readings under guidance of a staff member.

4305. Individualized Readings in Greek Literature (3). Major works of selected Greek prose writers. Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor.

4306. Readings in Greek Literature (3:3:0). Major works of selected Greek poets. Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor.

Courses in Hebrew. (HBRW)

1301, 1302. A Beginning Course in Hebrew I, II (3:3:0 each). Introduction to Hebrew.

Courses in Italian. (ITAL)

1301, 1302. A Beginning Course in Italian I, II (3:3:0 each).

2301, 2302. A Second Course in Italian I, II (3:3:0 each). Prerequisite: ITAL 1301 and 1302, or equivalent. Reading, cultural background, conversation, and composition.

3303. Italian Conversation (3). Prerequisite: ITAL 2301 and 2302, or equivalent. This course is designed to increase vocabulary and fluency in the spoken language.

4300. Individual Problems in Italian (3). Prerequisite: ITAL 2301 and 2302, or equivalent. Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor. Independent work under guidance of a staff member.

Courses in Latin. (LAT)

1301, 1302. A Beginning Course in Latin I, II (3:3:0 each).

2301, 2302. A Second Course in Latin I, II (3:3:0 each). Prerequisite: LAT 1301 and 1302, or two units of high school Latin. Review; selected readings from standard authors. (Honors section offered.)

4300. Individual Problems in Latin (3). Contents will vary to meet the needs of the students. May be repeated for credit with consent of instructor. Independent reading under guidance of a staff member.

4302. Advanced Composition and Grammar Review (3). Practice in Latin prose composition. Required of Latin majors.

4305. Individualized Readings in Latin Literature (3). Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor. Major works of selected Latin writers.

4306. Readings in Latin Literature (3:3:0). Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor. Major works of selected Latin dramatists and poets.

4310. Topics in Roman Life (3:3:0). Selected studies in social and political systems, values, and beliefs. May be repeated for credit with consent of instructor.

Courses in Portuguese. (PORT)

1301, 1302. A Beginning Course in Portuguese I, II (3:3:0 each).

2301, 2302. A Second Course in Portuguese I, II (3:3:0 each). Prerequisite: PORT 1301 and 1302, or equivalent. Reading, cultural background, conversation, and composition.

3303. Portuguese Conversation (3). Prerequisite: PORT 2301 and 2302, or equivalent. This course is designed to increase vocabulary and fluency in the spoken language. May be repeated for credit with consent of instructor.

4300. Individual Problems in Portuguese (3). Prerequisite: PORT 2301 and 2302, or equivalent. Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor. Independent work under guidance of a staff member.

4305. Individualized Readings in Portuguese and Brazilian Language and Literature (3). Prerequisite: PORT 2301 and 2302, or equivalent. Contents will vary to meet the needs of students. Major works of selected Portuguese and Brazilian writers. Conducted in Portuguese.

Courses in Spanish. (SPAN)

SPAN 3301 and 3302, or the equivalent, are prerequisites for all courses in the 4000 series. All courses in the 4000 series except 4302, 4303, 4304, and 4307 may be repeated for credit with departmental consent.

1303, 1304. El Español para el Hispano-Hablante, I, II, Spanish for the Spanish Speaker (3:3:0 each). Prerequisite: Departmental consent. A beginning course in Spanish for Spanish speakers.

1401, 1402. A Beginning Course in Spanish I, II (4:3:2 each).

2301, 2302. A Second Course in Spanish I, II (3:3:0 each). Prerequisite: SPAN 1401 and 1402, or two units of high school Spanish. Reading, cultural background, conversation, and composition.

3301. Hispanic Life and Culture (3:3:0). Origins, development, and characteristics of Hispanic life and culture. Conducted in Spanish.

3302. Representative Writings of the Hispanic World (3:3:0). Conducted in Spanish.

3303. Spanish Conversation (3:3:0). Prerequisite: SPAN 2301 and 2302 or the equivalent. This course is designed to increase vocabulary and fluency in the spoken language. May not be taken following 4000-level work.

3399. Hispanic Literature in Translation (3:3:0). Studies of interesting and significant examples from Hispanic literatures. Instructions and readings in English. Not for major or minor credit.

4100. Advanced Individual Problems in Spanish (1). Prerequisite: SPAN 2301 or equivalent, together with consent of instructor and department chairperson. Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor. Specifically designed for individual projects calling for fewer than 3 semester credit hours.

4300. Individual Problems in Spanish (3). Contents will vary to meet the needs of the students. May be repeated for credit with consent of instructor. Independent work under the guidance of a staff member. Prerequisite: SPAN 2301 or equivalent, together with consent of instructor and department chairperson.

4302. Advanced Grammar (3:3:0). Spanish language, syntax, and grammar.

4303. Phonetics and Conversation (3:3:0). May be taken concurrently with either SPAN 3301 or 3302. Development of correct pronunciation and oral skills for communication.

4304. Commercial Spanish (3:3:0). Oral and written Spanish with special attention to accurate and idiomatic expressions currently in use in the business and technical fields.

4307. Advanced Composition (3:3:0). Principles of correct writing and stylistics.

4310. Masterpieces of Spanish Literature (3:3:0). An introduction to the history of Spanish literature through selected works and authors.

4312. Spanish Prose Fiction (3:3:0). Readings of selected prose works in Spanish literature. Contents will vary to meet the needs of students.

4314. Spanish Drama and Poetry (3:3:0). Readings of selected dramas and poetry in Spanish literature. Contents will vary to meet the needs of students.

4315. Spanish Short Story (3:3:0). The rise and development of the Spanish short story up to the present day.

4316. Generation of '98 (3:3:0). Readings of selected authors and works, including Unamuno, Valle-Inclán, and Benavente.

4317. Readings in Spanish Literature (3:3:0). Readings of selected authors and works in Spanish literature. Content will vary to meet the needs of students.

4320. Masterpieces of Hispanic American Literature (3:3:0). An introduction to the history of Hispanic American literature through selected works and authors.

4321. The Latin American Novel I (3:3:0). A survey of the novel of Latin America.

4322. Literature of the Mexican Revolution (3:3:0). Reading and critical analysis of selected representative works dealing with the theme of the Mexican Revolution.

4323. The Literature of Social Protest in Contemporary Latin America (3:3:0). Major post-World War II socio-literary currents; selected readings in the novel, short story, poetry, and theatre.

4325. The Latin American Short Story (3:3:0). The rise and development of the Latin American short story from the period of Independence to the present.

4327. Readings in Spanish American Literature and Civilization (3:3:0). The content of this course will vary to meet the needs of the students.

4328, 4329. Mexico Field Course (3:3:0 each). Prerequisite: Consent of instructor. A study of the various phases of Mexican civilization: history, arts, language, literature and customs. Special emphasis is given to the development of oral skills. Offered in Mexico each summer.

4332. Civilización Hispánica: Hispanic Civilization (3:3:0). A thematic study of Spanish and Spanish American patterns of civilization, especially in the contemporary period, and the Americas' Spanish heritage.

4360. Studies in Chicano Life and Literature (3:3:0). This course is designed to familiarize the student with the history, culture, and literature of the Mexican-American people.

4391. Spanish for the Classroom (3:3:0). Standard and regional language and grammar for the prospective teacher in a bilingual setting. (Course credit only for those seeking teacher certification.)

Courses in Linguistics. (LING)

4311. Methods for Teaching Modern Foreign Languages (3:3:0). Prerequisite: FREN or SPAN 3301 and 3302 and 6 hours of education. Instruction in methods currently employed in the teaching of foreign languages. Required of majors and minors seeking teacher certification. May be repeated for credit in a different language.

4335. Linguistic Analysis for Bilingual Education/ESL (3:3:0). Linguistic analysis (applied, descriptive, and/or contrastive) as it relates to the teaching of bilingual education or English as a second language.

Department of Economics

Professor John Wittman, Chairperson.

Professors Gilliam, Hill, Jonish, Rouse, and Troub; Associate Professors Bumpass, Butler, Gilbert, Steinmeier, and Walker; Assistant Professors Cervin, Gott, Harber, and Yu; Adjunct Professor Krause; Visiting Assistant Professor Angirasa.

This department supervises the following degree programs: ECONOMICS, *Bachelor of Arts, Bachelor of Science, Master of Arts, Doctor of Philosophy;* INTERNATIONAL TRADE, *Bachelor of Science in International Trade.* The department also supervises the professional requirements of the economics major for the Bachelor of Business Administration degree offered through the College of Business Administration.

The undergraduate program leading to the Bachelor of Arts degree is offered to students who want to pursue a broad liberal education while, at the same time, studying the complex interrelationships between consumers, producers, and governments in an economic system. A minimum of 30 semester hours in economics courses (including ECO 3311, 3312, 4314, and AECO 3401 or its equivalent),

and 18 semester hours in a minor field are required for the B.A. degree. Candidates for the B.A. degree in economics are encouraged to consult with their advisors and to select from the wide range of possibilities a complementing set of economics and noneconomics electives in accordance with their developing interests. Other requirements are specified in the General Degree Requirements section of the College of Arts and Sciences.

The undergraduate program leading to the Bachelor of Science degree combines a broad liberal education with rigorous and extensive training in theoretical and mathematical economics. The program is highly structured and technically oriented. Students in this curriculum are required to major in economics and to minor in mathematics. The economics major must include ECO 2311, 2312, 3311, 3312, 3313, AECO 4312, and 21 hours of advanced economics electives. The mathematics minor consists of 18 hours of mathematics subject to the approval of the Mathematics Department. The basic requirements are listed in the General Degree Requirements of the College of Arts and Sciences. The adjunct requirements include two-semester course sequences in statistics and in computer science — both of which are subject to the approval of the economics faculty advisor.

The B.S. in international trade degree program provides correlated emphasis on international economics, international politics, international business, and foreign area studies and/or business administration. Course requirements for this degree are specified in the General Degree Requirements section of the College of Arts and Sciences.

At least a C in all economics courses in all programs is required of majors and minors. Moreover, a minimum grade of C is required in all core courses in the B.S. degree in international trade. Courses specifically required in the core by course number for the B.S. degree in international trade may not be taken pass-fail. Courses required for the major or minor on the B.A. or B.S. degree in Economics may not be taken pass-fail. Courses taken pass-fail by a student before declaring a major or minor will be evaluated by the curriculum committee of the department and a decision rendered as to whether they will satisfy the degree requirements.

Courses in Economics. (ECO)

2305. Principles of Economics (3:3:0). An abridged course for students not majoring in economics. Covers the most significant portions of ECO 2311 and 2312, with emphasis upon monetary and fiscal policy. Credit will not be given for both ECO 2305 and 2311.

2311. Principles of Economics I (3:3:0). An introduction to modern economic society and theories of production and exchange. Emphasis upon monetary and fiscal policy and macroeconomics. Credit will not be given for both ECO 2305 and 2311.

2312. Principles of Economics II (3:3:0). A continuation of ECO 2311. Emphasis on theories of the firm, value and price determination, and functional distribution, with the application of these theories to the problems of particular firms, industries, and markets.

3301. Economic Problems of Ethnic Minorities (3:3:0). Prerequisite: Junior standing. Description and analysis of economic problems unique to or particularly applicable to the ethnic minorities. Concentration on the ethnic minorities of the Southwest. Emphasis on historical development and current policies.

3302. Economics of Urban Problems (3:3:0). Prerequisite: Junior standing or consent of instructor. An institutionalist economic analysis of the causes and effects of and possible solutions to contemporary urban problems.

3303. Environmental Economics (3:3:0). Prerequisite: Junior standing or consent of instructor. An application of methods and techniques of economic analysis to the definition, analysis, and solution of environmental pollution problems.

3311. National Income Analysis (3:3:0). Prerequisite: ECO 2311. Analysis of the determinants of aggregate demand and supply with special emphasis on macroeconomic problems such as unemployment and inflation and on techniques used to forecast macroeconomic variables.

3312. Intermediate Economic Theory (3:3:0). Prerequisite: ECO 2312. Intermediate price theory and introduction to welfare theory. Includes theory of demand, theory of the firm, and welfare theory.

3313. Introduction to Quantitative Economic Analysis (3:3:0). Prerequisite: ECO 2312 and MATH 1330 or equivalent. Use of the basic concepts and symbolism of mathematics in the presentation of economic theory.

3320. Economics of Business Enterprise (3:3:0). Prerequisite: ECO 2312. The application of economic theory to problems of business enterprise.

3322. Economics of Labor (3:3:0). Prerequisite: ECO 2312. The theory of wages, the problems of unemployment, economic insecurity, industrial disputes, industrial accidents, development and aims of labor unions, and employers' associations.

3323. Principles of Money, Banking, and Credit (3:3:0). Prerequisite: ECO 2312. A basic course including consideration of monetary standards, organization and functioning of the commercial banking system and the Federal Reserve System, problems of money, prices, and credit control. Recent monetary and banking trends are emphasized. (FIN 3323)

3324. Taxation and Public Expenditures (3:3:0). Prerequisite: ECO 2312. Analysis of economic aspects of government finance; principles and problems of taxation, public expenditures, budgetary controls, and debt management.

3326. The Economics of Regulated Enterprise (3:3:0). Prerequisite: ECO 2312 or consent of instructor. Analyses of the operations of industries supervised by government commissions. Emphasis placed on the rationale for such controls in terms of the legal and economic development of the "public utility" concept.

3330. Economic Systems (3:3:0). Prerequisite: ECO 2312. The control of economic institutions for the welfare of the general community. The main principles of a planned economy and existing economic systems.

3333. International Economics (3:3:0). Prerequisite: ECO 2312 or consent of instructor. Principles of international trade, balance of payments, trade policies, and agreements.

4300. Economic Research (3). Prerequisite: ECO 3311 and 3312. Economics major, or consent of instructor or chairperson. Directed undergraduate student research in selected areas under the supervision of selected departmental faculty.

4301. Current Economic Problems (3:3:0). Fundamental problems of economic life today and proposed solutions. Emphasis on monetary and fiscal problems and policies.

4314. Development of Economic Doctrines (3:3:0). Prerequisite: ECO 2312. The basis, nature, and effects of economic doctrines from ancient times through the nineteenth century.

4315. Contemporary Economic Doctrines (3:3:0). Prerequisite: ECO 4314 or consent of instructor. The basis, nature, and effects of economic doctrines developed during the twentieth century.

4322. Manpower Problems and Policies (3:3:0). Prerequisite: ECO 2311 and 2312 or consent of instructor. A critical study of contemporary manpower problems and the policies that are being applied to solve these problems. Emphasis will be placed on the development of new directions for manpower policy.

4323. Monetary Theory (3:3:0). Prerequisite: ECO 2312. A theoretical and empirical analysis of the determination of income flows, the price level, and interest rates.

4331. Economics of Multinational Enterprise (3:3:0). Prerequisite: ECO 2312 or consent of instructor. Examination of the economics of international enterprise, associations with the major dimensions of the international economy, and with international political economy.

4332. International Finance (3:3:0). Prerequisite: ECO 3323, 3333, or consent of instructor. A study of the international monetary system in its theoretical and institutional setting. The flows of financial claims between countries both on current and capital account, and the function of the foreign exchange market in arbitrage and hedging. The position of an individual business firm in conducting international trade the procedures and practices in financing international transactions. (B A 4328)

4333. International Economic Relations (3:3:0). Prerequisite: ECO 3333 or consent of instructor. A critical evaluation of selected international economic problems.

4334. Economics of Growth and Development (3:3:0). Prerequisite: ECO 2312 or consent of instructor. A survey of the theories of economic growth and development including an evaluation of policies intended to achieve growth as well as to maintain a high rate of growth.

Department of English

Professor Daryl E. Jones, Chairperson.

Horn Professors Higdon and Walker; Professors Culp, Cunningham, K. Davis, Eddleman, Langford, McDonald, Mogan, D. Rude, Sullivan, Terrell, and Wages; Associate Professors Aycock, Brewer, Crider, D. Davis, Gilbert, Kuriyama, McBride, Shaw, Smitten, Tanner, and Weinsheimer; Assistant Professors Barker, Clarke, Cooley, Crowell, Daghistany, Foster, J. Harris, Hult, Laib, Markley, Poffenbarger, C. Rude, Rushing, Samson, Schoenecke, Weedman, Whitlark, and Whitsitt; Instructors Allen, Bustamantes, Downs, Fendley, Gamso, L. Harris, P. Harris, Kerschen, Lauck, McDowell, Reynolds, Rylander, Walsh, Waters, Whipple, and Whittle.

This department supervises the following degree programs: ENGLISH, *Bachelor of Arts, Master of Arts,* and *Doctor of Philosophy.* The department also cooperates in the interdepartmental programs in linguistic and semiotic studies and comparative literature at both the undergraduate and the graduate levels.

The department sponsors the local chapter of Sigma Tau Delta, national English honorary, which publishes the *Harbinger,* a literary magazine. The department publishes the international journals *Conradiana* and *The Eighteenth Century: Theory and Interpretation.*

English majors may specialize in literature and language, in writing and editing, or in creative writing. In addition, they may elect programs including certification for teaching on both elementary and secondary levels of public school.

English majors and minors should report to the Director of Undergraduate Studies for academic advice. Graduate students should report to the Director of Graduate Studies. Further information on graduate studies is available in the University *Graduate Catalog.*

No more than 9 hours of basic English course requirements may be applied toward the 18 hours required for a minor in English with a B.A. degree. At least 6

hours of the minor requirement must be of junior or senior rank. For electives, students who have completed their degree requirements in English may select any 3000- or 4000-level course. To receive credit toward graduation, a student who is an English major or minor must receive at least a C in all courses in English.

Basic English Course Requirements

Students who score 360 or below (verbal) on the SAT examination or 15 or below (English) on the ACT examination are required to pass ENGL 1300 before they take ENGL 1301. Although ENGL 1300 is recorded on the transcript, the hours do not count as part of the minimum number of hours required for graduation in any degree program of the University.

ENGL 1301 and 1302 are required of all undergraduate students. Some colleges require additional hours in English; students should consult their advisors concerning additional English courses which they may be required to take.

Six hours of freshman English (1301, 1302) are prerequisites for all sophomore courses (2301, 2302, 2307, 2308, 2309) and for all upper-division courses.

Literature and Language Specialization

ENGL 1301, 1302 and 2301, 2302, or 2307, 2308 are prerequisites for an English major with a specialization in literature and language. Majors must offer for graduation a minimum of 21 hours in English above the freshman and sophomore levels. The plan includes the following seven courses:

I. At least one course from each of the following groups:
   A. British literature before 1700: ENGL 3300, 3301, 3303, 3306, 4303, 4304, 4305, 4306
   B. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319
   C. American literature: ENGL 3323, 3324, 3325, 3326, 3327, 3328, 4320, 4325
   D. Advanced writing, comparative literature, language, linguistics: ENGL 3331, 3340, 3351, 3370, 3371, 4333, 4334, 4335, 4336, 4337, 4341, 4351, 4360, 4365, 4372, 4373

II. Two additional courses from one of the four groups listed above.

III. One additional course from those listed in the four groups above, or ENGL 3380 or 3381.

Writing and Editing Specialization

The major in English with a specialization in writing and editing is designed for students wishing to become technical and professional writers and editors. This plan is also designed for students wishing to enter graduate professional schools, such as law school and medical school, in which written communication plays an important part.

Students selecting the writing and editing plan are advised to minor in and choose electives from disciplines within which they expect to write or edit. Minor courses or electives in pure and applied sciences, engineering, business, agricultural science, and home economics, for example, provide supporting skills which are helpful in technical and professional writing and editing.

Required courses for the writing and editing specialization include two courses in college rhetoric (ENGL 1301 and 1302) and two of the following sophomore-level courses:

ENGL 2301, 2302, 2307, 2308, 2309

Advanced courses include seven courses from the following two groups:

I. Four core courses:
ENGL 3365, 4360, 4366, and one of the following: ENGL 3370, 4351, 4365

II. Three supplemental courses (one course from each of three of the following groups):
   A. Creative writing: ENGL 3351
   B. Comparative literature, criticism, and language: ENGL 3331, 3340, 3371, 4333, 4334, 4335, 4336, 4337, 4372, or 4373
   C. American literature: ENGL 3323, 3324, 3325, 3326, 3327, 3328, or 4320
   D. British literature: ENGL 3300, 3301, 3303, 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319, 4303, 4304, 4305, or 4306

Information concerning teacher certification on the secondary level with the writing and editing specialization is available from the Director of Undergraduate Studies in English.

Creative Writing Specialization

The major in English with a specialization in creative writing is designed for students wishing to write fiction or poetry, or both, with the guidance of teachers who write. This plan allows maximum concentration in literature courses so that, as they write, students may further understand and appreciate the aspects and techniques of fiction and of poetry. In addition to the opportunities for writing and for literary study, this specialization is especially appropriate for students interested in teaching creative writing and literature at the secondary level, in studying creative writing and literature in graduate school, and in preparing for professional graduate schools, such as law and business.

For teacher certification on the secondary level with the creative writing specialization, students should consult the Director of Undergraduate Studies in English.

Required for the creative writing specialization are two courses in college rhetoric (ENGL 1301 and 1302) and two sophomore-level literature courses (ENGL 2301 and 2302 or 2307 and 2308).

Advanced courses include seven courses from the following three groups:

I. ENGL 3351

II. ENGL 4351 (to be repeated for credit). Enrollment in ENGL 4351 and continuation in the creative writing specialization require successful completion of ENGL 3351 and the consent of the creative writing staff.

III. Four courses from the following:
   A. Fiction: ENGL 3316, 3318, 3319, 3326, or 3331
   B. Poetry: ENGL 3317 or 3327
   C. Drama: ENGL 4304, 4305, or 4320
   D. Period and author courses: ENGL 3300, 3301, 3303, 3306, 3311, 3312, 3314, 3315, 3323, 3324, 3325, 4303, or 4306
   E. Comparative literature, criticism, folklore: ENGL 3328, 3340, 4333, 4334, 4335, 4336, or 4337

Certification for Teaching. Students seeking a provisional certificate with English as a teaching field may satisfy the requirement in English through either the Bachelor of Arts degree or the Bachelor of Science in Education degree. A grade of C or higher in all advanced courses is required. Students wishing to follow any of the degree programs leading to certification should consult the Director of Undergraduate Studies in English.

Interdisciplinary Program for Preparing English Teachers (B.A. in English or B.S. in Education)

This secondary-school certification program is designed as a broadfield program with no second teaching field. It requires courses in English, speech, journalism, classics, and specialized courses in education, such as adolescent literature, teaching developmental and corrective reading, and teaching English to the bilingual or linguistically deprived adolescent. The student may take either a Bachelor of Arts degree or a Bachelor of Science in Education degree by satisfying the appropriate academic foundation requirements.

For the student in the interdisciplinary program, the curriculum includes the following seventeen courses:

I. At least one course from each of the following groups:
   A. Comparative literature: ENGL 3331, 4334, 4335, 4336, 4337
   B. British literature before 1700: ENGL 3300, 3301, 3303, 4303, 4304, 4305, 4306
   C. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319
   D. Literary criticism: ENGL 3340
   E. Writing: ENGL 3351, 4351, 4360
   F. Language: ENGL 3370, 3371

II. At least two American literature courses from the following: ENGL 3323, 3324, 3325, 3326, 3327, 3328, 4320

III. One additional advanced English course. Suggested electives are ENGL 4372 or 4373

IV. EDSE 4353 or 4354

V. JOUR 4310

VI. CLAS 1320

VII. Two courses from the following: SCOM 1303, 2304; TH A 2303

VIII. EDCI 3341, 4342, EDSE 4352

IX. EPSY 3330, EDSE 3300, 3321, 4351, 4692

English courses selected from the preceding list must meet the following requirements:

I. Three period courses selected from the following: ENGL 3300, 3301, 3303, 3311, 3312, 3314, 3315, 3323, 3324, 3325

II. One genre course selected from each of the following:
   A. Drama: ENGL 4304, 4305, 4320
   B. Fiction: ENGL 3316, 3318, 3319, 3325, 3326, 3331
   C. Poetry: ENGL 3314, 3315, 3317, 3327

The following courses fulfill the requirements for one of the genres, depending upon the content of the course: ENGL 3306, 4325, 4334, 4335, and 4337.

Program for Preparing Teachers with English as a First Teaching Field (B.A. in English)

For the English major seeking the degree of Bachelor of Arts and teacher certification on the secondary level, the program includes the following seven advanced courses:

I. At least one course from each of the following groups:
   A. British literature before 1700: ENGL 3300, 3301, 3303, 3306, 4303, 4304, 4305, 4306
   B. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319
   C. Comparative literature, literary criticism, methods: ENGL 3331, 3340, 3351, 4333, 4334, 4335, 4336, 4337, 4341, 4351, 4360
   D. Language: ENGL 3370, 3371, 4372, 4373

II. Two American literature courses from the following: ENGL 3323, 3324, 3325, 3326, 3327, 3328, 4320, 4325

III. One additional course from any of the courses listed under I or II above, or ENGL 3380 or 3381.

The following education courses are required: EPSY 3330, EDSE 3300, 3321, 4351, and 4692

Program for Preparing Teachers with English as a Second Teaching Field

For students seeking a bachelor's degree with a major other than English, but who wish to be certified to teach English on the secondary level, the program includes the following six advanced courses:

I. At least one course from each of the following groups:
   A. British literature before 1700: ENGL 3300, 3301, 3303, 3306, 4303, 4304, 4305, 4306
   B. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319
   C. Language: ENGL 3370, 3371, 4372, 4373
   D. Comparative literature, literary criticism, methods: ENGL 3331, 3340, 3351, 4333, 4334, 4335, 4336, 4337, 4341, 4351, 4360

III. Two courses from American literature:
   A. ENGL 3323 or 3324
   B. One course from the following (a student may elect to take both courses under A above and omit B): ENGL 3325, 3326, 3327, 3328, 4320, 4325

Program for Preparing English Teachers (B.S. in Education)

For the student seeking the degree of Bachelor of Science in Education with certification to teach English on the secondary level, the program includes the following six advanced courses:

I. At least one course from each of the following groups:
   A. British literature before 1700: ENGL 3300, 3301, 3303, 3306, 4303, 4304, 4305, 4306
   B. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319
   C. Language: ENGL 3370, 3371, 4372, 4373

D. Comparative literature, literary criticism, methods: ENGL 3331, 3340, 3351, 4333, 4334, 4335, 4336, 4337, 4341, 4351, 4360

II. Two courses from American literature:
   A. ENGL 3323 or 3324
   B. One course from the following (a student may elect to take both courses under A above and omit B): ENGL 3325, 3326, 3327, 3328, 4320, 4325

English Majors Seeking Certification for Elementary School Teaching (B.A. in English)

For students seeking the degree of Bachelor of Arts with a major in English and with certification to teach on the elementary level, the program includes the following:

A. Completion of the requirements for the degree of Bachelor of Arts with a major in English, which must include one course from each of the categories listed under B below.
B. Completion of specific courses under Plan I or Plan II (selected from those contained in the program for an English major) as follows:

Plan I. English specialization. One course required from each of the following groups:
1. American literature: ENGL 3323, 3324, 3325
2. Language: ENGL 3370, 3371, 4372, 4373
3. British and comparative literature and writing: ENGL 3331, 4304, 4305, 4336, 4360

Plan II. English specialization. One course required from each of the following groups:
1. British literature: ENGL 3301, 4304, 4305
2. American literature: ENGL 3323, 3324, 3325
3. Language: ENGL 3370, 3371, 4372, 4373
4. Comparative literature and writing: ENGL 3331, 4336, 4360

Program for Preparing Elementary School Teachers with English Certification (B.S. in Education)

Students seeking the degree of Bachelor of Science in Education with elementary certification in English may elect either Plan I or Plan II as follows:

Plan I. English specialization. One course required from each of the following groups:
1. American literature: ENGL 3323, 3324, 3325
2. Language: ENGL 3370, 3371, 4372, 4373
3. British and comparative literature and writing: ENGL 3331, 4304, 4305, 4336, 4360

Plan II. English specialization. One course required from each of the following groups:
1. British literature: ENGL 3301, 4304, 4305
2. American literature: ENGL 3323, 3324, 3325
3. Language: ENGL 3370, 3371, 4372, 4373
4. Comparative literature and writing: ENGL 3331, 4336, 4360

English Seminars. The English seminars — ENGL 3306 and 4325 — are open to any junior with a B average. Students majoring in English or in education may want to take one or more of these seminars as valuable preparation in their fields. Students seeking to graduate "In Honors Studies" may count any of these courses as part of the honors program, and other students may be interested in the special topics offered.

Courses in English. (ENGL)

1300. Essentials of English Usage (3:3:0). Emphasis on grammatical principles, sentence construction, and paragraph form. Students are assigned to this course on the basis of entrance examinations (SAT verbal, 360 or below; ACT English, 15 or below). Those assigned to this course must successfully complete it before registration in ENGL 1301. Not applicable toward general degree requirement in any degree program in the University. Hours for ENGL 1300 are in addition to the minimum number needed for graduation.

1301. Essentials of College Rhetoric (3:3:0). Prerequisite: Successful completion of ENGL 1300 or a satisfactory score on SAT, ACT, or English Department Examination. A student may be required to transfer to ENGL 1300 on the basis of the results of an English Department Examination and writing sample. Emphasis of the course is on grammar skills as they relate to writing and on rhetorical modes of exposition.

1302. Advanced College Rhetoric (3:3:0). Prerequisite: Successful completion of ENGL 1301 or satisfactory scores on entrance examinations (SAT/ACT), and successful completion of the English Department Examination. A student may be required to transfer to ENGL 1300 on the basis of the results of an English Department Examination and writing sample. Course will emphasize logic, argument, and methods of research.

2301, 2302. Masterpieces of Literature (3:3:0 each). Prerequisite: ENGL 1301 and 1302. 2301: Representative works of Greek dramatists or of Old and Middle English writers, Chaucer, Shakespeare, and Milton. 2302: Six to eight masterpieces selected from the works of writers of the eighteenth, nineteenth, and twentieth centuries. (Honors section offered.)

2307. Introduction to Fiction (3:3:0). Prerequisite: ENGL 1301 and 1302. An introduction to the critical study of fiction, emphasizing the careful analysis of short stories and novels.

2308. Introduction to Poetry and Drama (3:3:0). Prerequisite: ENGL 1301 and 1302. An introduction to the critical study of poetry and drama, emphasizing the careful analysis of lyric and narrative poems and of several dramatic genres.

2309. Patterns of Reports and Correspondence (3:3:0). Prerequisite: ENGL 1301 and 1302. Introduction to the patterns of writing used in reports and letters for business, industry, and technology.

3300. British Literature: Beowulf through Malory (3:3:0). Poetry and prose from 700 to 1500.

3301. British Literature of the Renaissance Period (3:3:0). British poetry and prose of the sixteenth century.

3303. English Literature of the Seventeenth Century (3:3:0). Poetry and prose written during the first two-thirds of the seventeenth century.

3306. Seminar in Earlier British Literature (from 700 to 1700) (3:3:0). Prerequisite: B average. A focus on selected works relating to a special theme, genre, movement, or author. Topic varies.

3311. British Literature of the Restoration and Early Eighteenth Century (3:3:0). Poetry, prose, and drama from 1660 to 1745.

3312. British Literature of the Later Eighteenth Century (3:3:0). Poetry, prose, and drama from 1745 to 1800.

3314. British Literature of the Romantic Period (3:3:0). Poetry and prose from 1780 to 1830.

3315. British Literature of the Victorian Period (3:3:0). Poetry and prose from 1830 to 1900.

3316. British Prose Fiction of the Twentieth Century (3:3:0). Major writers of prose fiction of the twentieth century.

3317. British Poetry of the Twentieth Century (3:3:0). Major poetic movements and poets of the twentieth century.

3318. English Novel to 1832 (3:3:0). Major authors from 1700 to 1832.

3319. English Novel After 1832 (3:3:0). Major authors from 1832 to 1900.

3323. American Literature I (3:3:0). Major writers and literary movements to 1865.

3324. American Literature II (3:3:0). Major writers and literary movements from 1865 to around 1930.

3325. American Literature III (3:3:0). Major writers and literary movements from around 1930 to the present.

3326. American Novel (3:3:0). Representative works of major American novelists.

3327. Major American Poets (3:3:0). Introduction to American poetic traditions through a study of representative works of major American poets.

3328. Survey of American Folklore (3:3:0). Major elements of the oral tradition such as ballads, folktales, proverbs, dialect, supernatural lore, and the lore of American folk heroes.

3331. Short Story (3:3:0). Short stories around the world.

3340. Introduction to Literary Criticism (3:3:0). Theories and traditions of literary criticism.

3351. Creative Writing (3:3:0). For students who want to write fiction or poetry. Discussion of basic techniques of fiction and poetry with emphasis on students' own writing.

3365. Elements of Technical and Professional Writing (3:3:0). Prerequisite: ENGL 2309 or consent of instructor. Preparation of professional and academic reports and publications through the use of communications analysis.

3370. Advanced Grammar (3:3:0). The syntactic and morphological analysis of modern English including its social and regional dialects.

3371. Introduction to Linguistic Science (3:3:0). Modern theory and practice in the description of natural languages with special emphasis on phonology and phonetics.

3380. Film Studies (3:3:0). Prerequisite: ENGL 1301 and 1302. Concepts of visual and aural communication and a survey of various film genres.

3381. Futuristic Fiction (3:3:0). Prerequisite: ENGL 1301 and 1302. The analysis and criticism of the literary methods and style by which fantasy and science fiction explore cultural, psychological, and scientific issues.

4303. Chaucer (3:3:0). Poetry written by Chaucer, with emphasis on *The Canterbury Tales* and *Troilus and Criseyde*.

4304. Selected Plays of Shakespeare I (3:3:0). Nine to twelve plays selected from the following: *The Comedy of Errors; Titus Andronicus; Taming of the Shrew; Richard II; King John; Henry IV, Part I; Much Ado About Nothing; Julius Caesar; Twelfth Night; Hamlet; Othello; Measure for Measure; Coriolanus; Timon of Athens; Pericles; The Tempest; Henry VIII.*

4305. Selected Plays of Shakespeare II (3:3:0). Nine to twelve plays selected from the following: *Henry VI, Parts I, II, III; Richard III; Two Gentlemen of Verona; Love's Labour's Lost; Romeo and Juliet; A Midsummer Night's Dream; Merchant of Venice; Henry IV, Part II; Henry V; As You Like It; Merry Wives of Windsor; Troilus and Cressida; All's Well that Ends Well; King Lear; Macbeth; Antony and Cleopatra; Cymbeline; The Winter's Tale.*

4306. Milton and His Age (3:3:0). Poetry and prose written by John Milton.

4320. Modern American Drama (3:3:0). Modern American drama from O'Neill to the present.

4325. Seminar in Later American Literature (from 1865 to the Present) (3:3:0). Prerequisite: B average. A focus on selected works relating to a special theme, genre, movement, or author. Topic varies.

4333. Philosophical Ideas in Literature (3:3:0). The evolution of philosophical ideas in British and American Literature and in works in translation. Prerequisite: Senior standing or consent of instructor. (PHIL 4333)

4334. Comparative Literature (3:3:0). Themes and motifs (love, justice, war, the quest, regeneration, etc.) in world literatures in translation.

4335. Comparative Literature (3:3:0). Types and genres (novel, epic, short story, drama, poetry, *Bildungsroman*, etc.) in world literatures in translation.

4336. Ancient and Medieval Literature (3:3:0). Representative works in translation, primarily Greek and Roman.

4337. Modern Continental Literature (3:3:0). Representative international works in translation.

4341. Teaching English in Secondary Schools (3:3:0). Prerequisite: Two advanced courses in English. A study of basic elements of grammatical usage, composition, and literary genres, with emphasis on fundamental knowledge and skills applicable to the teaching of English in secondary schools.

4351. Creative Writing Workshop (3:3:0). Prerequisite: ENGL 3351 and consent of instructor. Form and techniques of fiction or poetry, with emphasis on writing and discussion of the student's work. May be repeated for credit.

4360. Advanced Exposition (3:3:0). Nonfiction writing, lectures, and conferences to establish clarity, effectiveness, and precision in writing.

4365. Advanced Technical and Professional Writing (3:3:0). Prerequisite: ENGL 3365. Advanced techniques used in writing for publication in business, science, technology, and the professions. Practical experience with university and community writing projects.

4366. Technical and Professional Editing (3:3:0). Prerequisite: ENGL 3365. Methods of editing and publishing in business, science, technology, and the professions. Practical experience with editing reports and publications produced in the university.

4372. History of the English Language (3:3:0). An historical and descriptive survey of the English language in the context of the cultural development of the English-speaking peoples.

4373. Historical Comparative Linguistics (3:3:0). Principles of historical linguistics, the comparative method, and language families of the world.

Department of Geography

Professor Otis W. Templer, Chairperson.
Professors Conroy, C. Davidson, and Elbow; Assistant Professor Giardino; Instructors J. Davidson and Frank.

This department supervises the following degree program: GEOGRAPHY, *Bachelor of Arts*. The department also participates in the LATIN AMERICAN AREA STUDIES program leading to the *Bachelor of Arts* degree and in the environmental studies, international studies, and urban studies minor programs.

Students majoring in geography must complete 30 hours in geography, including at least one course in each of the following areas: human geography, physical geography, regional geography, and geographic tools or techniques. As

an alternative to the general major in geography, a student may select a specialization in community planning, environmental studies, or remote sensing-cartography. Minors are required to complete 18 hours in geography, including at least one course in three of the four general areas cited above for majors.

Teacher Education. In the teacher certification programs, geography may be used as a teaching field at the secondary level and as an 18- or 24-hour area of specialization at the elementary level. Geography course work is also included in the Plan II social science composite field certification program in secondary education. Specific course requirements for each of these programs may be obtained from the Department of Geography.

Courses in Geography. (GEOG)

Courses marked with an asterisk may be used in fulfilling laboratory and nonlaboratory science requirements.

*1101, 1102. **Physical Geography Laboratory (1:0:2 each).** Optional laboratories for GEOG 1301, 1302. GEOG 1101 accompanies GEOG 1301 and GEOG 1102 accompanies GEOG 1302.

*1301, 1302. **Introduction to Physical Geography (3:3:0 each).** Study of the physical world including the characteristics, processes of formation, distribution, and interrelationships of land and water, climate, vegetation, and soils. Both courses fulfill the science requirement and either may be taken. GEOG 1301 focuses on climate and the biosphere; GEOG 1302 focuses on landforms, soils, and the hydrosphere.

2300. **Geography for a Changing Society (3:3:0).** Introduction to topics and research methods in social geography such as demographic change, urban development, ethnic patterns, and spatial characteristics of political and economic systems.

2351. **Regional Geography of the World (3:3:0).** An introduction to the geography of world regions for students who have had no previous geography courses.

3300. **Introduction to Mapping (3:1:4).** An introduction to cartography, including map design, current mapping techniques, and cartographic drafting.

3303. **Principles of Map Reading and Interpretation (3:3:0).** An introduction to the principles of map reading, interpretation, and application.

*3335. **Field Seminar in Physical Geography (3:3:0).** Seminar conducted in field setting to provide students with first-half opportunity for observing actual physical and human aspects of area study. Specific region and topic may vary. May be repeated for credit with change of subject matter.

3337. **Man's Economic Environment (3:3:0).** Consideration of the characteristics and distribution of man's production and consumption of goods and services, and of variation and interaction of economic activities among areas of the earth's surface.

3351. **Geography of Urban Places (3:3:0).** An analysis of the location, distribution, function, and spread of urban places, including a study of current urban problems — sprawl, city decline, and metropolitan transportation.

3352. **Geography of the United States and Canada (3:3:0).** Study of the physical and cultural geography of the United States and Canada.

3353. **Man, Resources, and Environment (3:3:0).** Survey of the interrelated problems of population growth, efficient use of natural resources, and human disruption of the earth's environment.

3354. **Historical Geography of the United States (3:3:0).** Survey of the settlement geography of the United States in the 18th and 19th centuries with special emphasis on Texas.

3355. Field Methods in Community Studies (3:2:3). An introduction to the techniques and tools used by geographers in gathering and presenting data from the field.

3356. Contemporary Texas and the American Southwest (3:3:0). Study of the physical and contemporary cultural geography of Texas and the American Southwest.

3360. Geography of Mankind (3:3:0). Study of human occupation and utilization of the earth. Explores the physical, cultural, and historical bases for the distribution of man's activities.

3363. Geography of Latin America (3:3:0). Study of the physical and human geography of Latin America, with special emphasis on problems of urban and rural development.

3403. Principles of Remote Sensing (4:3:2). An introduction to the principles and applications of remote sensing. Systems include aerial photographs, false color infrared, miocrowave, Landsat, thermal infrared, and side-look radar.

4100. Individual Studies in Geography (1). Prerequisite: Senior standing and consent of instructor. May be repeated one time for credit.

4305. Geographical Aspects of International Development Planning (3:3:0). Review of spatial aspects of development of agriculture, urban areas, transportation, and industry in Third World regions with the emphasis on Latin America.

***4321. Physical Geography: Biogeography (3:3:0).** Prerequisite: Introductory physical geography or consent of instructor. Study of plants and animals in their spatial context, their functional interaction, and applied aspects of biogeography, especially as related to man's impact on the biosphere.

4330. Advanced Cartography (3:2:3). Prerequisite: GEOG 3300 and 3403 or consent of instructor. Study and application of current mapping techniques, including scribing, computer mapping, and cartographic design.

4357. Geography of Arid Lands (3:3:0). Systemic and regional inquiry into the physical nature and the problems of human utilization of the arid and semiarid lands of the earth.

4369. Readings in Geography (3). Conference course. May be repeated for credit.

***4401. Applied Geomorphology (4:3:2).** Prerequisite: GEOG 1302 or consent of instructor. Evaluation and analysis of earth-forming processes and terrain features in relation to human activities. Course emphasizes analytical techniques.

***4402. Regional Geomorphology (4:3:2).** Prerequisite: Introductory physical geography or consent of instructor. Study of the causative relationships between physical processes and materials from which the landscapes of North America have been derived. Special emphasis on U.S. regions.

4600. Internship in Geography (6). Prerequisite: Minimum of 12 hours in geography, minimum 3.25 GPA in geography, and consent of instructor. Supervised activity in a nonacademic setting. Students gain experience in the working world while having the opportunity to utilize accumulated geographic concepts and tools.

Department of Geosciences

Professor Alonzo D. Jacka, Acting Chairperson.

University Professor Murray; Professors Cebull, Güven, Haragan, Harris, Mattox, Peterson, Reeves, and Shurbet; Associate Professors Jurica and Leary; Assistant Professors Barnes, Barrick, Strathearn, and Yeats; Instructor Harrison.

This department supervises the following degree programs: GEOSCIENCE, *Bachelor of Arts, Bachelor of Science, Master of Science, Doctor of Philosophy;* ATMOSPHERIC SCIENCE, *Master of Science.* Areas of specialization at the undergraduate level include geology and geophysics.

All bachelor's degree programs require an 18-hour minor which may be in a single discipline or selected from a variety of disciplines with departmental approval. The minor for a Bachelor of Science degree program is usually in biology, chemistry, physics, mathematics, computer science, engineering, supporting areas of geosciences, or a combination thereof. Fewer restrictions are placed on the selection of a minor for a Bachelor of Arts degree.

Grades below C in required courses of either the major or minor of a geosciences program are not acceptable in fulfillment of the degree requirements.

The program leading to the Bachelor of Arts degree is designed to provide a broad liberal arts background and basic training in the principles of geosciences. The program is designed for the student with strong interests in earth processes and the history of nature's initiation of and response to continuous change. The degree is tailored toward instruction in making one aware of the transient character of both physical and aesthetic resources. Candidates for the B.A. degree would ordinarily be expected to seek subsequent professional development in allied areas such as environmental control, land planning, mining law, and secondary education. Programs leading to the Bachelor of Science degree provide more intensive training in the physical sciences.

A special group of earth science courses is available for students in liberal arts, education, or other nontechnical fields. Geology majors may not use courses from the earth science group in satisfying degree requirements.

Teacher Education. Students completing the Bachelor of Arts or the Bachelor of Science degree, together with the special requirements for teacher certification, including required courses in professional education in two teaching fields, will be qualified to teach earth science in the public schools of Texas. Biology, chemistry, physics, or mathematics is recommended as a second teaching field.

Those students using earth science as a teaching field for the Bachelor of Science in Education degree must complete 24 semester hours of earth science. Students who elect the broad-field science teaching plan with a concentration in earth science must complete 33 semester hours of earth science courses.

Bachelor of Science Degree Requirements. All curricula require 12 hours of English, 6 to 14 hours of foreign language, 6 hours of American history, 6 hours of political science, 6 hours of nonscience, nonmathematics electives, and 2 hours of P.E., band, or ROTC. The specializations in geology and geophysics also require MATH 1350, 1351, and 1352; CHEM 1307, 1103, 1308, and 1104; and PHYS 1308, 1105, 2301, and 1106. MATH 1551, 1552 may be substituted for MATH 1350, 1351, 1352.

Students desiring an area of specialization in geology should include GEOL 2200, 2201, 2401, 2402, 3301, 3302, 3320, 3321, 3350, 3600, 4314, and 4320 plus a minimum of 9 hours selected from the following courses for the B.S. degree: GEOL 3351, 4101, 4312, 4319, 4323, 4324, G PH 2300, 3321, 4320, 4321, and 4323.

An area of specialization in geophysics requires MATH 2350 and 3350; an advanced physics course; GEOL 2401 and 3302; G PH 2300 and 3321; and 21 hours of electives. The following list is an example of courses that may be taken to satisfy the 21 hours of electives: G PH 4320, 4321, 4323; GEOL 2200, 2201, 3320, 3321, 3301, 3600, 4312, 4314, 4319, 4320; MATH 3351, 3354, 4354;

PHYS 3305, 3306, 3401, 4304, 4305; ATMO 3301; C E 2301, 3302; C S 1302; I E 3201.

Courses in Atmospheric Science. (ATMO)

2300. Descriptive Meteorology (3:3:0). A nontechnical treatment of atmospheric processes and the physical principles which control weather and climate.

3100. Analysis and Instrumentation Laboratory (1:0:3). Discussion and practical experience in weather analysis, methods of instrumentation, and observational meteorology.

3301. General Meteorology (3:3:0). Prerequisite: MATH 1551 or equivalent. A basic study of atmospheric processes and the principles which control them.

3302. Physical Climatology (3:3:0). An introduction to the study of processes controlling the climates of the earth and their classification.

4201. Undergraduate Seminar (2:2:0). Research and discussion on topics of current interest.

Courses in Geochemistry. (G CH)

4305. General Geochemistry (3:3:0). Prerequisite: GEOL 2200, 2201, 3321, CHEM 1308, MATH 1352. Introduction to chemical investigations in geology. Topics include isotopic systems, thermodynamics, solution and crystal chemistry, and their applications.

Courses in Geology. (GEOL)

GEOL 1306, 1307, 2303, 2305, 3303 and 3304 are designed for students in nonscientific disciplines, including earth science education. They may not be taken by geosciences majors to fulfill degree requirements.

1101. Physical Geology Laboratory (1:0:2). Laboratory study of rocks, minerals, and geologic mapping. (Honors section offered.)

1102. Historical Geology Laboratory (1:0:2). Laboratory study of fossils, geologic maps, and geologic structure. (Honors section offered.)

1303. Physical Geology (3:3:0). Beginning course. A study of earth materials (rocks and minerals), gradation (erosion and deposition), diastrophism (earth movements and mountain building), vulcanism and earth resources. (Honors section offered.)

1304. Historical Geology (3:3:0). Prerequisite: GEOL 1303. A study of the history and evolution of the earth and life from the beginning of time to the present. (Honors section offered.)

1306. Gems and Gemstones (3:3:0). History, origin, classification, distribution, and importance of gemstones. Part of lecture will be used to study actual gemstones and methods of gem identification.

1307. Geology of the National Parks (3:3:0). Prerequisite: GEOL 1303, 1304 recommended but not required. Survey of the geomorphology, structural and historical geology of specific national parks, national monuments, and other areas having outstanding geological features.

1308. Man and His Earth (3:3:0). Interaction of man and his natural environment. Topics include the energy crisis, pollution, mineral wealth of the oceans, prediction and control of earthquakes and volcanoes.

2200. Mineralogy (2:1:3). Prerequisite: CHEM 1307, 1103, and GEOL 2401. Identification and classification of minerals in hand specimens based on their physical and chemical properties.

2201. Introduction to Crystallography and Crystal Chemistry (2:1:3). Prerequisite: CHEM 1307, 1103, and GEOL 2401. Study of crystal chemical principles related to the structure and physical properties of minerals. External and internal symmetry properties of crystals are studied in models.

2303. Geology for Engineers (3:2:3). Analysis of fundamental geologic processes, resulting products and landforms, and classification and properties of rock, sediment, and soil materials. Laboratory exercises include classification, analysis, and properties of materials and interpretation of topographic and geologic maps. Practical and economic applications considered.

2305. Common Rocks and Minerals (3:2:3). Prerequisite: GEOL 1303. Classification, origin, and uses of the common minerals and rocks. Laboratories are devoted to hand-specimen identification of the materials. One required field trip.

2401. Principles of Geology I (4:3:3). Introductory course for majors and students in related disciplines. Physical-chemical laws and principles applied to earth materials. Methods of investigation which produces quantitative data from field and laboratory studies are utilized.

2402. Principles of Geology II (4:3:3). Prerequisite: GEOL 2401. An in-depth survey of fundamental geologic principles presented within the context of a review of major features of earth history.

3101. Interpretation of Topographic and Geologic Maps (1:0:3). Prerequisite: GEOL 2401 and 2402. The uses of topographic, geologic, and other types of maps in geologic work.

3200. Introductory Field Geology (2:1:2). Prerequisite: GEOL 2401 and 2402.

3300. Surface Water (3:3:0). Prerequisite: GEOL 1303, 1101. Survey course of overland flow, stream morphology, stream dynamics, stream transport, basin analysis, and stream deposits.

3301. Geomorphology and Aerial Photointerpretation (3:2:3). Prerequisite: GEOL 2401 and 2402, or consent of instructor. Introductory course in processes which produce morphogenic changes at earth's surface. Evolutionary development of hillslopes and drainage channels. Illustrated by aerial photos.

3302. Structural Geology (3:2:3). Prerequisite: GEOL 2200, 2201, and 3320 recommended for geology majors. Topics include rock mechanics, folds, joints, faults, structural petrology, crystalline-rock structures, and geotectonics. Laboratory work concerns structural aspects of surface and subsurface mapping and interpretation including the use of stereonets.

3304. Land Forms and Structures (3:3:0). Prerequisite: GEOL 1303. Specific and regional aspects of landscape features and earth structures. Emphasis is placed on the geology of well-known areas, such as the national parks.

3307. Ground Water (3:3:0). Introduction to principles of hydraulic characteristics of rocks, environmental considerations, and water quality problems.

3320. Optical Mineralogy and Petrology (3:2:3). Prerequisite: GEOL 2200, 2201. Principles of transmitted light within isotropic and anisotropic crystals, and the identification of minerals by observation and measurement of their behavior in plane-polarized light. Emphasis on variations due to chemical changes in the common rock-forming silicates.

3321. Igneous and Metamorphic Petrography-Petrology (3:2:3). Prerequisite: GEOL 3320. Origin and differentiation of magma. Recrystallization of rock bodies and interpretation of physical environment from mineral phases. Systematic classifications of rocks based on mineralogy, chemistry and mode of formation.

3350, 3351. Invertebrate Paleontology I & II (3:2:3 each). Prerequisite: GEOL 2402; 2200 recommended. Consideration of characteristic morphology, paleoecology, and taxonomy of the major invertebrate groups. The first semester covers history of paleontology through the phylum *Brachiopoda;* the second semester covers the phyla *Mollusca, Echinodermata,* and *Anthropoda.*

3600. Field Geology (6). Prerequisite: Junior standing in geology. Comprehensive study of field relationships of igneous, sedimentary, and metamorphic rocks. Standard methods of field analysis are applied. A final written geologic report is required.

4101. Undergraduate Seminar (1:1:0). May be repeated for credit.

4308. Introduction to Volcanology (3:2:3). Prerequisite: GEOL 3321. Topics include descriptive volcanology and theoretical aspects such as properties of magma, phase equilibria, experimental studies, and the effects of volatiles.

4312. Undergraduate Research (3). Independent research in an area of current interest in the geosciences.

4314. Principles of Stratigraphy (3:3:0). Review of geologic processes, terminology, and methods of analyses and their relationships to the study of the origin, composition, and age relationship of rocks in the earth's crust.

4318. Geology of Texas (3:3:0). A comprehensive study of the structure, stratigraphy and economic geology of Texas and parts of adjacent states.

4319. Economic Geology (3:2:3). Prerequisite: GEOL 3321. Physical, chemical, and structural parameters controlling the formation of ore deposits. Identification of sulfide minerals and the interpretation of textures as related to the origin of ores. Visits to mining properties are scheduled and required.

4320. Sedimentology (3:2:3). Topics include (1) relationship of sedimentation to igneous and metamorphic activity and diastrophism, (2) principles of weathering, (3) soil formation and classification, (4) classification of sedimentary materials, (5) erosion, transportation, and deposition of sediments, (6) classification and salient characteristics and depositional environments, (7) relationships of organisms and sediments, (8) relationships of sediments and climates, and (9) lithification of sedimentary materials.

4322. Physical Oceanography (3:3:0). Prerequisite: GEOL 2401 and advanced standing. A study of the physiography and origin of ocean basins and of the processes and systems operative in them including physical, chemical, and biological factors as well as sedimentation patterns.

4323. Introductory Environmental Geology (3:3:0). Prerequisite: GEOL 2401, 2402 and advanced standing, and GEOL 3301 for geology majors. A study of the geological factors related to environmental problems and the applications of geological knowledge to management of the environment.

4324. Geology of Hydrocarbons (3:3:0). A study of the world-wide distribution and geologic setting of petroleum in addition to methods of exploration.

Courses in Geophysics (G PH)

2300. Introduction to Geophysics (3:3:0). A basic introduction to solid earth geophysics with emphasis on the internal structure of the earth.

3321. Geophysical Methods (3:3:0). Prerequisite: GEOL 3302, MATH 1551, PHYS 2301, 1106, and G PH 2300. The earth's gravity and magnetic fields are discussed with application to problems in geophysical and seismic prospecting.

3322. Introduction to Seismic Interpretation (3:2:3). Prerequisite: G PH 3321. Study of seismic velocities and their determination from reflection seismic records, well surveys, and sonic well logs. Laboratory emphasis on interpretation techniques.

4320. Introduction to Earth Physics (3:3:0). Prerequisite: G PH 3321.

4321. Earthquake Seismology (3:2:3). Prerequisite: G PH 3321, MATH 1552. Problems of earth structure and geotectonics are discussed by relating them to interpretation of earthquake seismograms. World Standard seismograms are used as the model for seismogram interpretation.

4323. Applications in Geophysics (3:1:6). Prerequisite: G PH 3321 and GEOL 3302. Geophysical methods will be applied to the solution of selected field problems. May be repeated for credit.

4325. Geomagnetism (3:3:0). Prerequisite: G PH 3321, MATH 1552. Study of spatial and temporal morphology of earth's magnetic field; magnetisation of minerals and rocks; magnetic scalar potential and field of dipole and two-dimensional structure.

Department of Germanic and Slavic Languages

Professor Ulrich Goebel, Chairperson.
Professors Alexander and Zyla; Associate Professors Bacon and McClain; Visiting Assistant Professor Hunt.

This department supervises the following degree programs: GERMAN, *Bachelor of Arts, Master of Arts.* In addition, the department participates in the BILINGUAL SECRETARIAL program leading to the *Bachelor of Arts* degree and in the interdepartmental programs in linguistic and semiotic studies and comparative literature at the graduate level. (For graduate programs and courses, see *Graduate Catalog.*) Instruction is offered in Russian language and literature with independent study available in other Slavic languages and literatures such as Czech, Polish, and Ukrainian.

An undergraduate major in German consists of 30 hours at the 2000 level and above. A minor may be obtained in German or Russian. The minimum requirement for a minor is 15 hours at the 2000 level and above in one language; this includes at least 3 hours at the 4000 level. Students who have had three or four units of German or Russian in high school may enter the German or Russian course numbered 3301 and acquire a 12-hour minor by completing 6 hours of 3000 courses and 6 hours of 4000 courses in either language. With this 12-hour minor the foreign language requirement for the Bachelor of Arts degree is also fulfilled. Students wishing to use foreign language courses to fulfill the humanities elective requirement should consult the chairperson of the department for additional information.

Students wishing to major in German, or to minor in German or Russian, should consult the chairperson of the department.

Students who have had two years (i.e., two units) of German or Russian in high school, and who wish to continue study in that language, should enroll in GERM 2301 (GERM 2303 for science majors) or RUSN 2301, though with special permission they may enroll in the 1401 course. Courses numbered 1401 have no prerequisite of study of the language. Persons who have had three or four years of German or Russian in high school, and who wish to continue study in the same language, should enroll in GERM 3301 or RUSN 3301.

Students are expected to complete 6 hours at the sophomore level for general degree requirements. Thus, if they have studied German or Russian for two or more years in high school, sophomore courses will complete the requirement. No students from a German- or Russian-speaking country who graduated from a secondary school in their native land may receive credit for a course in their native language numbered below 4000.

Students pursuing a comparative literature program may include RUSN 3301 and 3302 in their studies.

Teacher Education. For certification purposes, a teaching field is offered in German, with a minimum standard program requiring 24 hours of courses numbered 2000 and above. These must include 9 hours of courses on the 4000 level and GERM 4310.

Courses in Czech. (CZEC)

1301, 1302. A Beginning Course in Czech (3:3:0 each). Oral practice, elementary reading, and grammar.

2301, 2302. A Second Course in Czech (3:3:0 each). Reading, cultural background, grammar review, conversation, and composition.

Courses in German. (GERM)

1305. German Pronunciation and Diction (3:3:0). Prerequisite: Consent of director of specific programs and chairperson of Department of Germanic and Slavic Languages. Audio-lingual approach to German phonetics with objective of correct pronunciation. Includes introduction to International Phonetic Alphabet and relationship between pronunciation and the printed language. (See also FREN 1305)

1401, 1402. A Beginning Course in German (4:3:2 each). Oral practice, elementary reading, and grammar.

2301, 2302. A Second Course in German (3:3:0 each). Prerequisite: GERM 1401, 1402, or two units of high school German. Reading, cultural background, grammar review, conversation, and composition. GERM 2301, 2302, and 2303, 2304 may not both be counted toward a degree.

2303, 2304. Scientific German (3:3:0 each). Prerequisite: GERM 1401, 1402 or two units of high school German. Specially prepared scientific readings, with grammar review, for premedical and science students. GERM 2301, 2302, and 2303, 2304 may not both be counted toward a degree.

3301, 3302. German Life and Literature (3:3:0 each). Prerequisite: GERM 2301, 2302, or 2303, 2304, or equivalent. Representative short stories, novels, dramas, and lyrics. Composition and conversation based on readings. Conducted in German.

3303. Advanced Conversational German (3:3:0). Prerequisite: GERM 2302 or 2304 or equivalent. This course is designed to increase vocabulary and fluency in the spoken language. May be taken concurrently with GERM 3301 or 3302.

4300. Individual Studies in German (3). Prerequisite: GERM 3301 and 3302, or equivalent. Independent study in German under guidance of a staff member, with content varying according to needs. May be repeated for credit with consent of instructor. Conducted in German.

4301. Advanced Grammar and Composition (3:3:0). Prerequisite: GERM 3301 and 3302 or equivalent, or concurrent with GERM 3301 or 3302. Review of grammatical structure and phonetics. Practice in pronunciation and in written and spoken German. Required of German majors. Conducted in German.

4302. The Age of Goethe (3:3:0). Prerequisite: GERM 3301 and 3302, or equivalent. Representative readings extending from mid-eighteenth-century Rationalism, through Storm and Stress, the "Hochklassik" of Goethe and Schiller (around 1800), and early nineteenth-century Romanticism. Conducted in German.

4303. Nineteenth Century German Literature (3:3:0). Prerequisite: GERM 3301 and 3302 and consent of instructor. Readings in prose, poetry, and drama from Romanticism to Naturalism, beginning with Tieck and including Hauptmann. Conducted in German.

4304. Studies in Twentieth Century German Literature (3:3:0). Prerequisite: GERM 3301 or 3302 and consent of instructor. An overview of prominent writers

from Expressionism to the present, normally with emphasis on a specific genre or literary movement. Conducted in German.

4305. Readings in German Language and Literature I (3:3:0). Prerequisite: GERM 3301 and 3302 or equivalent. Readings in a particular period: Classical, Romantic, or Contemporary literature or development of German language. May be enrolled in twice concurrently for foreign study, or repeated for credit with consent of instructor. Conducted in German.

4306. Readings in German Language and Literature II (3:3:0). Prerequisite: GERM 3301 and 3302, or equivalent. Readings in a particular period: for instance, Classical, Romantic, or Contemporary literature, or development of German language. May be repeated for credit with consent of instructor. Conducted in German.

4307. The Contemporary German Play (3:3:0). Prerequisite: GERM 3301 or equivalent and consent of instructor. Intensive analysis of several plays, emphasizing problems of staging; one public performance; special stress on German pronunciation and conversational expression. May be repeated for credit with change in content.

4308. German Phonetics and Diction (3:3:0). Prerequisite: GERM 3301 and 3302 or equivalent. Theory and practice of principles of pronunciation and intonation, with introduction to International Phonetic Alphabet, practice in phonetic transcription, and physiological description of sounds. Individual laboratory exercises. Conducted in German.

4309. Topics in German Studies in Translation (3:3:0). Intensive analysis of some of the main trends in German literature and culture through selected readings and other visual aids. Instruction and readings in English.

4310. Methods in Teaching German (3:3:0). Prerequisite: GERM 3301, 3302, and 3303 or consent of instructor. Instructions in methodology as related to teaching German. Required of majors and minors seeking teaching certification.

Courses in Russian. (RUSN)

1401. A Beginning Course in Russian (4:3:2). Introduction and development of the four language skills: listening comprehension, speaking, reading, and writing.

1402. A Beginning Course in Russian (4:3:2). Prerequisite: RUSN 1401. Introduction and development of the four language skills: listening comprehension, speaking, reading, and writing.

2301. A Second Course in Russian (3:3:0). Prerequisite: RUSN 1401, 1402, or two units of high school Russian. Training in oral and written expression and in aural and reading comprehension, including optional work in the language laboratory. Grammar review.

2302. A Second Course in Russian (3:3:0). Prerequisite: RUSN 1401, 1402, or two units of high school Russian and RUSN 2301. Reading and discussion of a number of Russian texts related to significant aspects of Russian literature and culture. Practice in composition.

3301. Russian Literature in English Translation I (3:3:0). Survey of selected 19th century prose fiction by Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, Tolstoy, including comparisons with other European and American works.

3302. Russian Literature in English Translation II (3:3:0). Survey of selected 20th century Soviet and dissident literature, especially Solzhenitsyn. Emphasis on social, ideological, cultural criteria of period in relation to European/American literature.

Courses in Slavistics. (SLAV)

4300. Individual Studies in Slavistics (3). Prerequisite: RUSN 2302 or CZEC 2302 or equivalent. Independent study in Slavistics under guidance of a staff member, with content varying according to needs. May be repeated for credit with consent of instructor.

Department of Health, Physical Education, and Recreation

Professor Martin H. McIntyre, Chairperson.

Professors Burkhardt, Cobb, Owens, Philbrick, Rogers, Segrest, and Wilson; Associate Professors Bobo, Knipping, Kozar, Mason, McNally, Moore, Williams, and Willis; Assistant Professors Atkinson, Baillie, Borchardt, Fitch, Hall, McHaney, Morrow, Rupp, Segrist, and Stuyt; Instructors Arterburn, Bowes, Cotton, Crutchfield, Elam, Holihan, Hudson, Murray, Pruss, Ross, Tolbert, Weese, and Welter.

This department supervises the following degree programs: *Bachelor of Arts, Bachelor of Science in Physical Education* in PHYSICAL EDUCATION, DANCE, and RECREATION; *Bachelor of Science in Education, Master of Education* in PHYSICAL EDUCATION; *Master of Science* in SPORTS HEALTH. In addition the department supervises the basic physical education program for all students in the University.

Students planning to major, minor, specialize, or elect a teaching field in physical education and/or dance must present annually a report of a complete physical examination. Forms and the examination should be secured from the Student Health Center in Thompson Hall prior to October 1 for the fall semester or February 1 before entering the department in the spring semester. Completed forms should be returned to MG 207.

Basic Physical Education Program. To satisfy the All-University requirement of two semesters of physical education, a student may select from P E 1101, 1102, 1103, 1104, 1105, or 1106.

Students needing courses in the special adapted physical education program because of medical reasons should present a written statement from their physician to the departmental office one semester prior to the first class registration.

Students who pass any course as indicated by a section number may not repeat the same course section number or its sequence number for additional credit. All courses are laboratory in nature and involve individual instruction.

Bachelor of Science in Physical Education and Bachelor of Science in Education — Teaching Area in Health Education. The curricula for these degrees are designed to meet the requirements for certification in Texas at the secondary level.

Certification in Health Education: Students will complete work as follows:

HLED 1301, 2201, 2202, 3200, 3201, 4301; select 12 hours from HLED 2203, 2204, 2205, 2206, 3100, 3305, 3306, 3307, 3308.

The student who selects health education as an area of specialization on the elementary level may follow one of the following plans:

Plan I. HLED 2201, 2202, 3201, 3300; select a minimum of 9 hours from HLED 2203, 2204, 2205, 2206, 3100, 3305, 3306, 3307, 3308.

Plan II. HLED 1301, 2201, 2202, 3201, 3300; select a minimum of 12 hours from HLED 2203, 2204, 2205, 2206, 3100, 3305, 3306, 3307, 3308.

Minor in Health Education: Students seeking a minor in health education will complete work as follows:

HLED 1301, 2201, 2202, 3200; select 9 hours from HLED 2203, 2204, 2205, 2206, 2207, 3100, 3305, 3306, 3308, of which 6 hours must be upper level.

Bachelor of Science in Physical Education and Bachelor of Arts – Major in Physical Education. Students interested in teaching physical education in the public schools may major in physical education and/or select it as a teaching field. The courses in physical education are the same for both the B.A. and the B.S. in P.E. degrees. Students should follow the academic foundations for the selected degree as outlined in this catalog. Students who desire to teach on the secondary level must take P E 1201, 1202, 2105, 2209, 3100, 3205 or 3302, 3301, 4303, 4306, and 4307. In addition, students must select two sections of P E 3200 or one section of P E 3200 and P E 3206. In the skill development core students must select two dance activities (P E 2100); one aquatic activity (P E 2101 or P E 3204); four individual and dual sports (P E 2103); two team activities (P E 2104); P E 2102; and P E 2200.

Students interested in physical education as a major or as a teaching field must complete the following laboratory sciences or their equivalents: BIOL 1402, ZOOL 2403, and one of the following—BIOL 1401, CHEM 1305 and 1101, PHYS 1303 and 1101, or F&N 1301 and H E 2000. Students are also required to take PSY 2305 or the equivalent.

Students who wish to obtain all-level certification in order to qualify to teach physical education at the elementary and secondary levels will follow the program outlined above for secondary certification and in addition will take P E 2305, 3208, and 3306.

Students who wish to follow the all-level curriculum stressing aquatics must take the skill development core outlined above and P E 1201, 1202, 2105, 2305, 2209, 3200 (aquatics), 3200 (springboard diving), 3202, 3203, 3205, 3301, 3306, 4206, 4207, and 4307.

Students who wish to become athletic trainers in the public schools must follow certification programs in two teaching fields and in addition must complete the following courses: P E 2109, 2209, 3205, 3301, 3302, 3304, 4302 (twice), HLED 2202, 3308, ZOOL 2403, F&N 3340, and H E 2000. To qualify for national and Texas examinations, students must have between 1800 and 2700 hours of practical experience under the supervision of a certified trainer.

In addition to the courses listed in these curricula, the student must select a second teaching field and meet other requirements as outlined by the College of Education.

Students who wish to major in physical education but who do not wish to certify to teach will follow the nonteaching curriculum. These students must take P E 1201, 1202, and 2209 and the skill development courses outlined above. In addition, they must take 18 hours of 3000- and 4000-level physical education courses and select a minor of 18 hours, of which 6 hours must be upper-level courses.

Minor in Physical Education: Students seeking a minor in physical education will complete work as follows: P E 1201, 1202, 2209; a minimum of 6 hours chosen from P E 2100, 2101 or 3204, 2102, 2103, 2104, and 2200 with no more than 2 hours from any area; a minimum of 6 hours from P E 3100, 3205 or 3302,

3204 (if not selected above), 3200 and/or 3206, 3301, 3307, 3308, 4200, 4303, 4306, 4307.

Bachelor of Science in Education — Elementary Physical Education Specialization. The student who selects physical education as an area of specialization on the elementary level may follow one of these plans:

Plan I. P E 1202, 2201, 2301, 3205 or 3302, 3201, 3208, 3306, and 4306.

Plan II. P E 1202, 2201, 2301, 3205 or 3302, 3201, 3208, 3306, and 4306. In addition, select a minimum of 6 hours from the following: P E 2209, 3100, 3301, 4307.

Bachelor of Science in Physical Education and Bachelor of Arts — Major in Dance. This curriculum is designed to prepare students who are interested in the performing and fine arts or in teaching in private schools of dance or at the college level.

A dance major is required to complete 45 hours of study following either Plan I (ballet) or Plan II (modern dance). No minor is required.

Plan I allows the student to take up to 7 of the 45 hours from support areas, while Plan II permits up to 3 of the 45 hours. Both plans provide the student a choice in the senior year of studying either ballet (6 hours) or modern dance (4 hours).

The core includes DAN 1102 (1-2 semesters, Plan I only), 1103 (1-2 semesters), 1107 (1-2 semesters), 1204 (3-8 semesters), 1304 (5-8 semesters), 2102 (1-2 semesters, Plan II only), 3104 (1-2 semesters), 3201 (1-2 semesters, Plan II only), 3209, 4102 (1-2 semesters, Plan I only), 4104, and 4207. The support areas include DAN 3313, 4200, 4201, FIN 2320, P E 3301, HLED 2203, M TH 1301, TH A 2101, 2301, 3302, 3303, 3304, 3305, 3306, 3307, M LT 2308, 2309, 3304, 3308, M AP 1101, 1102, 1113, 1114, 1123, 1124, ART 1310, 1311, 1320, 1324, 1325, 1331, 1370, 1371, 3333, 3371, 3373, 3374, 3375, 3376.

Minor in Dance: Students seeking a minor in dance will complete the following courses: DAN 1107, 1204 (2 semesters), 1304 (2 semesters), 2102, 3104 (2 semesters) 4201, and 4207.

Bachelor of Science in Physical Education and Bachelor of Science in Education — Teaching Area in Dance. Students who are interested in teaching dance in the public schools should follow this curriculum. The earning of either of these degrees qualifies the student to teach dance at the secondary level. The student must meet all requirements for the B.S. in P.E. degree or the B.S. in Ed. degree and become familiar with the teacher education program. In addition, a second teaching field must be completed. The core program includes DAN 1102 or 2102, 1103, 1204 (3 semesters), 1304 (1 semester), 3104 (2 semesters), 3209, 3313, 4200, 4201, 4207, P E 3206, 3306, 2100 (3 semesters), M TH 1301.

Bachelor of Science in Physical Education and Bachelor of Arts — Major in Recreation. The department offers a program leading to the B.A. or B.S. in P.E. degree with a major in recreation which qualifies the graduate for positions in the various types of recreation programs offered by numerous groups and agencies. The general requirements for the B.A. or B.S. in P.E. degree will be met. All students majoring in recreation take a program consisting of the following courses: REC 1301, 1302, 2304, 2309, 3300, 3301, 3305, 4308, 4324, and

4600, ACCT 2303, ADV 3311, PALA 3301, SOC 3324 and 3391, POLS 4342, 4321, and 4353.

Minor Areas of Specialization: (minimum 18 hours) May be taken in business administration, community nutrition, computer science, counseling, economics, environmental studies, ethnic studies, finance, fine arts, geography, geology, horticulture, journalism, marketing, mass communications, park administration, physical education, psychology, public administration, public relations, social welfare, special education, wildlife management, or restaurant, hotel, and institutional management.

Minor in Recreation: Students seeking a minor in recreation will complete the following courses: REC 1301, 1302, 2304, 3301, and 4308.

Courses in Health Education. (HLED)

1301. The Health Education Profession (3:2:3). History, philosophy, and principles of the health sciences: school health education, community health education, and allied health.

1303. Patterns of Healthful Living (3:3:0). A study of patterns of mental, physical, and social development of the individual including relationships of individual and community health.

2201. Chronic Disease and the Quality of Life (2:2:0). A study of the chronic diseases which affect the quality of one's life, with special emphasis on prevention and methods of coping with disease.

2202. Reducing the Risk of Communicable Disease (2:2:0). A study of communicable diseases, with special emphasis on the prevention and control of these diseases.

2203. Nutritional Aspects of Health (2:2:0). An overview of the nutritional aspects of health with special emphasis on problems related to nutritional quackery, weight control, and dietary deficiency.

2204. Health Aspects of Aging (2:2:0). A study of the individual health problems faced during the aging process.

2205. Mental Health Education (2:2:0). A study of the mental health problems that may occur in the classroom, identification of mental health problems, and an examination of the teacher's role in improving student mental health.

2206. Death and Dying (2:2:0). A course covering salient issues and problems in dealing with death.

2207. Health Aspects of Human Sexuality (2:2:0). An analysis of the problems and issues involved in human sexuality. Designed for the general University student and open to all students except those enrolled in a health certification program.

3100. Health Education Workshop (1:1:0). Prerequisite: Junior standing. One-week workshop devoted to the study of problems in health education. May be repeated for credit.

3200. Field Experience in Health Education (2:0:6). Prerequisite: 9 hours of health education, including HLED 2201, 2202, or consent of instructor. Supervised leadership experiences in public, community, and school health education.

3201. The School Health Program (2:2:0). A study of the structure and function of the school health program with relationship to the home and the community.

3300. Methods of Teaching Health in the Elementary School (3:3:0). Prerequisite: Junior standing or consent of instructor. Basic principles and procedures of health education and their application to the total school health program.

3305. Consumer Health (3:3:0). An intensive study of factors influencing the consumer of health products and the resultant effect on man's health.

3306. Environmental Health (3:3:0). A study of relationships between man and specific ecosystems; emphasis on effects of imbalance such as pollution on man's health.

3307. Teaching About Human Sexuality (3:3:0). An analysis of problems and issues involved in human sexuality, with special emphasis for the educator.

3308. Risk-Taking Behavior in Health (3:3:0). A study of factors involved in alcoholism and drug abuse with implications and methods of implementation for the teacher.

4301. Methods of Teaching Health in the Secondary School (3:3:0). Prerequisite: Consent of instructor. Basic principles and procedures of health education, designed for those desiring certification in health education.

4302. Community Health Problems (3:3:0). A study of the purposes of community health and the problems encountered in the delivery of health services at the national, state, and local levels.

4600. Practicum in Community Health. (6). Prerequisite: Senior standing and consent of instructor. Supervised field experience in the practice of community health education.

Courses in Physical Education. (P E)

1101. Individual Activities (1:0:2).

1102. Dual Activities (1:0:2).

1103. Team Activities (1:0:2).

1104. Rhythmic Activities (1:0:2).

1105. Aquatics (1:0:2).

1106. Adapted Physical Education (1:0:2). For the student with a temporary or permanent physical impairment. Departmental approval is necessary prior to the first course registration.

1201. Concepts in Physical Education and Sport (2:2:0). An introduction to the profession of physical education including philosophical, historical, and scientific foundations; assessment of physical qualities.

1202. Motor Learning (2:1:2). A study of the many aspects of learning and performance of motor skills.

2100. Dance Activities (1:0:2). Skill techniques, knowledges, and teaching methods in selected dance activities. May be repeated for credit.

2101. Aquatic Activities (1:0:2). Prerequisite: Swimming proficiency. Skill techniques, knowledges, and teaching methods in selected aquatic activities.

2102. Track and Field Activities (1:0:2). Skill techniques, knowledges, and teaching methods in track and field activities for men and women.

2103. Individual and Dual Activities (1:0:2). Prerequisite: Proficiency tests. Skill techniques, knowledges, and teaching methods in selected individual and dual activities. May be repeated for credit.

2104. Team Activities (1:0:2). Prerequisite: Proficiency tests. Skill techniques, knowledges, and teaching methods in selected team activities. May be repeated for credit.

2105. Teaching Practicum (1). Prerequisite: Consent of instructor. Supervised teaching in a physical education service class. May be repeated once for credit.

2109. Scientific Bases of Exercise (Laboratory) (1:0:2). Prerequisite or corequisite: P E 2209. Laboratory experience in cardiovascular and respiratory dynamics, electromyography, and flexibility concepts. Required for students certifying in athletic training.

2200. Beginning Artistic Gymnastics (2:0:4). Skill techniques, knowledges, and teaching methods in gymnastics for men and women.

2201. Team Sports for the Elementary Schools (2:1:2). Skill techniques, knowledges, and teaching methods in basketball, softball, and volleyball.

2209. Scientific Bases of Exercise (2:1:2). A study of the integration of various physiological systems as they function during exercise and training.

2301. Field Sports for the Elementary Schools (3:1:4). Skill techniques, knowledges, and teaching methods in soccer, speedball, speed-away, and flag football.

2303. Methods of Teaching Physical Education in the Elementary School (3:3:0). A method and content course dealing with the theory and practice of physical education.

2304. Methods of Teaching Physical Education in the Elementary School (3:3:0). A method and content course dealing with the theory and practice of physical education. For early childhood majors only.

2305. Methods of Teaching Physical Education in the Elementary School (3:3:0). A method and content course dealing with the theory and practice of physical education. For elementary physical education specialists and all-level physical education majors only.

3100. Officiating Team Sports (1:1:0). The ethics, rules, and mechanics involved in officiating selected team sports.

3200. Teaching and Coaching of Sports (2:1:2). Prerequisite: Consent of instructor. Advanced methodology in teaching/coaching selected sports with emphasis on application of mechanical principles, training methods, and class and competition organization. May be repeated for credit.

3201. Educational Gymnastics (2:0:4). Fundamental movements and gymnastic movement patterns for elementary children, including teaching methodology.

3202. Aquatic Management: Pool and Waterfronts (2:2:0). Prerequisite: Water safety instruction. A course in the care, operation, and design of swimming pools and waterfront areas.

3203. Aquatic Activities, Games, and Exercise (2:1:2). Prerequisite: Water safety instructor certification. Designed to provide the student with background information and skill in various activities, games, and exercise programs which complement a complete aquatic program.

3204. Elementary Aquatics (2:1:2). Prerequisite: Swimming proficiency. Swimming fundamentals from beginner's swimming through lifesaving; principles, methods of teaching, leading to water safety instructor's certificate.

3205. First Aid (2:1:2). American Red Cross Standard and Instructors First Aid and Personal Safety course.

3206. Methods of Teaching Modern, Folk, and Social Forms (2:1:2). Prerequisite: Consent of instructor. Basic principles and procedures in teaching dance.

3208. Techniques of Elementary Games (2:1:2). A course designed to give elementary school physical education specialists and classroom teachers practical experience in teaching games and related activities.

3301. Mechanical Kinesiology (3:3:0). Prerequisite: ZOOL 2403 or equivalent. The mechanical analysis of human motion with emphasis on biomechanical principles and techniques.

3302. Care and Prevention of Athletic Injuries (3:3:0). Prerequisite: ZOOL 2403 or equivalent. An introduction to athletic training and the qualifications and functions of the athletic trainer including emphasis on common athletic injuries.

3304. Advanced Techniques of Athletic Training (3:3:0). Prerequisite: P E 3302. Administration of an athletic training program. Includes the use of therapeutic modalities and the advanced care, prevention, and treatment of athletic injuries.

3306. Techniques of Teaching Rhythms in the Elementary School (3:2:2). Practical experience in creative movement, singing and rhythmic games, folk and square dances, and the methods of teaching rhythmics to elementary children.

3307. Women in Sport and Exercises (3:3:0). Examination of the status of female sport participation based on historical, social, behavioral, and physiological factors.

3308. Sport in World Cultures (3:3:0). Historical and philosophical aspects of contemporary sport and leisure patterns across cultures, emphasizing the role of sport in society.

4200. Psychology of Coaching (2:2:0). A study of the psychological principles as they pertain to athletic coaching.

4206. Administration of the Aquatic Program (2:2:0). Prerequisite: Water safety instructor certification. Administration, coordination, and implementation of various areas of a comprehensive aquatic program.

4207. Aquatic Instruction for Special Populations (2:1:2). Prerequisite: Water safety instructor certification, ZOOL 2403, P E 3301, or equivalent. Application of aquatic techniques as related to the mentally retarded, emotionally disturbed, orthopedically impaired, and other atypical persons.

4302. Practicum in Athletic Training (3). Prerequisite: P E 3302, 3304, or consent of instructor. Supervised clinical experience in athletic training. May be repeated once for credit.

4303. Administration of Physical Education Programs (3:3:0). Philosophies, policies, and procedures in administration of the various facets of physical education programs.

4306. Adapted Physical Education (3:3:0). Theory and practice in administering and interpreting screening tests and adapting physical education content to the needs of the handicapped.

4307. Measurements in Physical Education (3:3:0). Techniques in physical education; a survey of tests used in physical education and methods of administering tests and interpreting data.

Courses in Dance. (DAN)

1102. Pantomine (1:0:2). An introduction and guide to the specialized exercises and essential physical elements to the art of pantomime. May be repeated once for credit.

1103. Jazz (1:0:3). A study of jazz techniques. May be repeated once for credit.

1107. Musical Stage Dance (1:0:3). An introduction to musical stage forms including hybrid forms of dance specifically for the broadway, television, or musical stage. May be repeated once for credit.

1204. Modern Dance (2:0:4½). A study of modern dance techniques.

1304. Ballet (3:0:7½). The academic study of ballet from its beginning to the most sophisticated forms. May be repeated for credit.

2102. Improvisation (1:0:2). Experiences in improvisation to develop spontaneity and heighten sensitive awareness so that movement response can become instantaneous. May be repeated once for credit.

3104. Dance Production Activities (1). Prerequisite: Consent of instructor. Participation in a dance production, either as a lighting designer, performer, choreographer, or crew head. May be repeated once for credit.

3201. Modern Dance Repertoire (2:0:4). Prerequisite: DAN 1204 and consent of instructor. Exposure to various modern dance choreography.

3209. Pedagogy (2:1:2). Prerequisite: Consent of instructor. Basic principles and guidelines for the teaching of ballet and modern dance.

3313. History of the Dance (3:3:0). History and philosophy of dance and the relationships of dance to allied arts.

4102. Partnering (1:0:2). Prerequisite: Consent of instructor. An introduction to supported adagio — the assimilation of the easiest methods of partner relationship on the stage. May be repeated once for credit.

4104. Senior Concert (1). Prerequisite: DAN 4207. Senior presentation of an original dance composition, including selection of music, costume, and lighting designs.

4200. Ethnic Dance (2:1:2). Prerequisite: DAN 1304. A study of Spanish and character dance.

4201. Special Topics in Dance (2:2:0). Prerequisite: Consent of instructor. Introduction to special topics in dance for in-depth study.

4207. Choreography (2:1:2). Prerequisite: DAN 1204, 1304. The study of the craft of composing ballet and modern dances.

Courses in Recreation. (REC)

1301. Introduction to Recreation and Leisure (3:3:0). Orientation to the field of organized recreation in terms of its history, philosophy, development, community contributions, and career opportunities.

1302. Dynamics of Leadership in Recreation (3:3:0). Emphasis on contemporary aspects of recreation leadership which includes leadership requirements, user needs, and the dynamics of organizations.

2304. Recreation for Special Populations (3:3:0). A study of recreation provided for such groups as the mentally ill and retarded, the physically disabled, the drug abuser, racial and ethnic groups, and the aged.

2309. Outdoor Recreation Management (3:3:0). An introduction to the management of the outdoors for recreation. Three major aspects will be emphasized: the resource, the visitor, and services provided.

3300. Industrial Recreation (3:3:0). A study of the growing role of business and industry in providing employee recreation. Major emphasis will be on employee relations, efficiency, and services.

3301. The Process of Recreation Programming (3:3:0). Study of the organization and planned use of recreation resources. Major emphasis will be on how to program recreation activities and experiences.

3303. Outdoor Recreation Skills (3:1:4). The introduction of basic outdoor recreation skills to persons involved in school, agency, or community outdoor recreation programs. Course covers skills, safety procedures and teaching techniques.

3305. Comprehensive Planning of Leisure Resources (3:3:0). A study of planning leisure resources, population trends, and evaluation of leisure services.

4308. Managing Leisure Service Organizations (3:3:0). Prerequisite: Junior standing. Application of contemporary techniques to the delivery of leisure services. Particular attention will be focused on the management of human resources.

4324. Current Trends in Recreation (3:3:0). Prerequisite: Senior standing. A study of trends and specific research topics in the areas of recreation.

4600. Internship in Recreation (6). Prerequisite: Departmental approval. An independent and supervised study course providing in-service training practice in the field of recreation.

Department of History

Professor Alwyn Barr, Chairperson.

Professors Blaisdell, Flynn, Graves and Kuethe; Associate Professors Blakeley, Brink, Chong, Collins, Harper, Hayes, King, Nelson, Newcomb, Traylor, Twyman, and Wunder; Assistant Professors Balderrama, Flores, Green, Hathorn, Howe, Locke, Mehls, Pach, Reinier, Sturgis, and Zimmerman.

This department supervises the following degree programs: HISTORY, *Bachelor of Arts, Master of Arts, Doctor of Philosophy.* The department also participates in the LATIN AMERICAN AREA STUDIES program leading to the *Bachelor of Arts* degree, in the Arts and Sciences minors in community and urban studies, environmental studies, ethnic studies, family life studies, humanities, and women's studies, and in the Arts and Sciences Honors program.

The broad liberal arts foundation available through a major in history can deepen students' understanding of the complex world in which they live, stimulate intellectual attitudes conducive to effective participation in contemporary society, and cultivate those mental skills required for meaningful employment in many areas of the modern economic system. A history student may consider a career in teaching in colleges and universities or in the public schools; in park administration; in regional and local historical society work; in archives and records management; in museum work; in various branches of government work; and in business and industry generally.

Students seeking an undergraduate degree in history will complete 30 hours of history including 3 hours from HIST 1300 or 2370 and 3 hours from HIST 1301 or 2371, 6 hours of U.S. history, 18 hours in advanced courses, including 3 hours each of U.S., European, and Third World history, and HIST 4398. U.S., European, and Third World courses are identified as (US), (E), and (TW) in the course list. With prior departmental consent, 3 advanced hours in related disciplines may be counted toward the major.

The department offers three variations of its major, two in conjunction with other departments in the College of Arts and Sciences. The pretheological specialization is offered in conjunction with the Department of Biblical Literature and consists of 36 hours as follows: 24 hours of history, 6 of which must be U.S. history, 12 of which must be advanced courses, and at least 6 of which must be from HIST 3340, 3344, 3391, 4328, 4344, 4347, 4349; 12 hours of Religion to be approved by the pretheological advisor in the Department of Biblical Literature. Students interested in this plan should consult with the pretheological advisors in the Department of History.

The art history specialization is offered in conjunction with the Department of Art. It consists of 33 hours including 21 hours of history approved by an art history advisor, at least 12 of which must be at the advanced level and at least 6 of which must be U.S. history; and 12 hours of art history courses from the Department of Art. Work must include one of the following courses: ART 3310, 4310, 4312, or HIST 4399. In exceptional cases, HIST 4397 may be substituted with the prior consent of an art history advisor in the Department of History. Students interested in this plan should consult with the art history advisors in the Department of History.

The prelaw specialization consists of 30 hours including HIST 2300 and 2301 (prelaw emphasis sections recommended); HIST 1300 or 2370 and 1301 or 2371 (2370 and 2371 recommended); 9 hours from HIST 4329, 4330, 4372, 4373, and 4398 (when it has a legal-constitutional emphasis); and 9 hours of other history courses, 3 hours of which must be Third World history. Courses numbered 3000 or above must account for 18 hours of the total.

A minor in history consists of 18 hours; 6 hours must be in U.S. history, 6 hours must be in non-U.S. history, and 6 hours, including 3 at the 4000-level, must be in advanced courses.

Under state law, all students who receive bachelor's degrees from Texas Tech University must complete 6 hours in American history. Students will normally fulfill this requirement by completing HIST 2300 and 2301. However, juniors, seniors, or students with approval by the department chairperson may satisfy this requirement by completing any 6 hours from among the American history courses listed as (US) in the course list.

All courses numbered above 3000 are advanced courses; departmental approval or junior classification or higher is prerequisite to enrollment in advanced courses. A student must receive at least a C in any history course if it is to count toward the major, minor, or teaching field requirements.

Teacher Education. In the teacher certification programs, history may be used as a teaching field at the secondary level, as an area of specialization at the elementary level, and as a part of the broad field of social sciences. Certification is possible through either the Bachelor of Science in Education degree or the Bachelor of Arts degree route.

The basic plan for all three certification programs requires HIST 2300 and 2301 (preferably taken in sections designated for majors, minors, and teaching field people) and HIST 1300 and 1301. Students may substitute HIST 2370 for HIST 1300 and HIST 2371 for HIST 1301. Those selecting history as the elementary Plan I teaching field will be required to complete 12 additional hours of advanced work, including 3 hours each from U.S., European, and Third World history. Those selecting history as the elementary Plan II teaching field or as the second secondary teaching field must complete 15 additional hours of advanced work, including 3 hours each from U.S., European, and Third World history. Those selecting history as the first secondary teaching field will be required to complete 18 additional hours of advanced work, including 3 hours each from U.S., European, and Third World history.

Courses in History. (HIST)

1300. Western Civilization I (3:3:0). Western civilization from its dawn to the seventeenth century. Culture and the arts stressed alongside politics. (E)

1301. Western Civilization II (3:3:0). The revolutionary transformations of European civilization in the seventeenth, eighteenth, and nineteenth centuries, world dominion and the world wars, intellectual and cultural developments. (E)

2300. History of the United States to 1877 (3:3:0). This and HIST 2301 satisfy the legislative history requirement. Most sections combine political, military, constitutional, and social history. Special sections, however, emphasize technology, agriculture, business, and family life. (Honors section offered.) (US)

2301. History of the United States since 1877 (3:3:0). Continuation of HIST 2300. (Honors section offered.) (US)

2370. History of England to 1714 (3:3:0). Traces the economic, social, and political history of England to 1714, emphasizing the development of such unique institutions as parliament and the common law. (E)

2371. History of England since 1714 (3:3:0). Traces the history of England since 1714, stressing economic, political, and social reform and the rise and fall of the British Empire. (E)

3300. Major Issues in American History (3:3:0). Study of selected topics on the history of the United States. Topics generally selected cooperatively by instructor and students. (US)

3310. History of Texas (3:3:0). A survey of Texas history beginning with the Native American occupation and tracing the major social, political, and economic developments of the state into the modern era. (US)

3311. Social and Cultural History of the Southwest (3:3:0). Survey of the history of the varied cultures of the American Southwest, emphasizing Anglo-American, Spanish-Mexican, and Indian backgrounds. (US)

3312. The Great Plains Experience (3:3:0). The study of the Great Plains as a region — its economic, political, and social development from Indian times to the present. (US)

3320. Immigrant Life in America (3:3:0). Study of immigration into the United States and the assimilation of ethnic groups into the American culture. Family history will be related to these themes. (US)

3322. History of the Modern Family (3:3:0). Traces the emergence of the family since 1600, especially in the United States; topics will include marriage, life cycle, childrearing, youth, and sexuality. (US)

3323. The History of Women in America (3:3:0). Emphasizes the political and economic history of women; their outside employment; advances in education and the professions; successes and failures in movements for equal rights. (US)

3324. History of Black People in the United States (3:3:0). A study of issues such as racism, family stability, separate social and religious status, efforts to overcome discrimination, and cultural developments. (US)

3325. History of Chicanos in the United States (3:3:0). Survey of the history of the Mexican-Americans of the United States, relating their collective experience to United States and Mexican history. (US)

3326. History of Native Americans in the United States (3:3:0). Survey of the history of American Indians from their earliest migrations through the acculturation, termination, and civil rights movements of the twentieth century. (US)

3327. Survey of American Environmental History (3:3:0). Prerequisite: Junior standing or consent of instructor. A survey of American environmental and conservation history from the Age of Discovery through the environmental awareness of the twentieth century. (US)

3331. History of United States Military Affairs to 1865 (3:3:0). Traces developments in U.S. military history from the Colonial period through the Civil War. (US)

3332. History of United States Military Affairs since 1865 (3:3:0). Follows U.S. military history from the post-Civil War period through World War II. (US)

3333. History of American Technology to 1900 (3:3:0). Historical development of American technology from the earliest times to 1900, with a stress on the ways in which technology has changed the way people live, work, and think. (US)

3334. History of American Technology since 1900 (3:3:0). A survey of some of the more important technological achievements that have led to America's world technological leadership and of the problems created by technology for modern society. (US)

3335. History of Agriculture in U.S. to 1890 (3:3:0). Survey of developments from the colonial period to 1890. Farming techniques, land policy, livestock production, mechanization, and the westward movement are featured. (US)

3336. History of Agriculture in U.S. since 1890 (3:3:0). Survey of major developments from Populism to the present. Technology, economic depressions, the role of government, and the beef industry are featured. (US)

3337. History of American Education (3:3:0). Survey of education's impact on American society. Schooling, the family, the mass media, religion, and modern critics of education are examined. (US)

3338. History of Sports and Recreation in the U.S. (3:3:0). Study of the development and role of sports and recreation in American social history with emphasis on organized amateur and professional sports. (US)

3339. The History of Baseball: A Mirror on America (3:3:0). Examines the history of the national pastime with an eye to how the sport has reflected and influenced American society since the late nineteenth century. (US)

3340. Ancient Civilization (3:3:0). Culture and politics of the Near East, Greece, and Rome 3000 B.C.-A.D. 500. Particular attention to religion (especially Judaism and Christianity), ethics, and philosophy. (E)

3341. Women in European Civilization (3:3:0). What women were supposed to do; what women did, from prehistory to the vote in 1920. (E)

3342. History of Assassination (3:3:0). Studies the age-old phenomenon of political murder in relation to the key personalities, plus the underlying political, social, and psychological forces that produced them. (E)

3343. The History of Medicine (3:3:0). The course will follow a chronological pattern and treat the development of professional and nonprofessional Western medicine as a social institution. (E)

3344. History of Christianity (3:3:0). Surveys Christianity from immediate pre-Christian era to present. Emphases on various churches and organizations, theology and Biblical studies, and Christianity's impact on Western culture. (E)

3347. The Middle Ages (3:3:0). Western Europe and its neighbors in the age of feudalism, chivalry, scholasticism, Gothic and Romanesque art, parliamentary beginnings, papal leadership, and monastic retreat. (E)

3348. The Crusades (3:3:0). Surveys the origins of the holy war ideal, the military campaigns and their leaders, life in the Crusader States, and the Crusades' ultimate results. (E)

3351. A History of Spain and Portugal (3:3:0). The political history, including the Moorish period, the reigns of Charles V and Philip II, and the twentieth century. Artistic Spain. Portugal, Spain in miniature. (E)

3353. A History of France (3:3:0). Political and social origins, unfolding, maturation. The personalities, ideas, conflicts, rulers such as Louis XIV, the Enlightenment, the great Revolution. The cultural heritage. (E)

3354. Modern England (3:3:0). Studies the twentieth century decline of England's world power and the creation of her "welfare state." The impact of world war on England is stressed. (E)

3358. Modern Germany, 1648-1918 (3:3:0). Surveys the history of Germany from the Peace of Westphalia (1648) through World War I. (E)

3359. The Nazi Era, 1919-1945 (3:3:0). Surveys post-World War I Germany, the rise of national socialism, Hitler in power, the Nazi State, and Germany in World War II. (E)

3365. History of European Warfare since the Renaissance (3:3:0). Studies the principal developments in European warfare since the Renaissance, stressing the impact of nationalism and industrialization. (E)

3366. The First World War (3:3:0). Studies the war that transformed the modern world, including the conflict's causes, fighting, and diplomacy as well as the social, political and intellectual consequences. (E)

3367. The Second World War (3:3:0). A history of the major diplomatic, military, social and economic developments associated with the Second World War. (E)

3370. History of Science from the Scientific Revolution to the Present (3:3:0). A survey of the development of science from the scientific revolution to the present, emphasizing scientific, chemical, Darwinian revolutions, and the rise of quantum theory.

3380. The World since 1945 (3:3:0). Survey of major themes in contemporary history. Foreign policy, economic change, cultural change, modernization, ecology, and the Third World are examined. (TW)

3381. Colonial Latin America (3:3:0). General introduction to the formation of Latin American civilization, including the Indian empires, voyages of discovery, conquest, extraction of treasure, pirates, and royal administration. (TW)

3382. Modern Latin America (3:3:0). Survey of the principal events in Latin American history beginning with the independence movement and reaching into the contemporary scene. (TW)

3390. The History of Exploration (3:3:0). Studies the history of exploration since the fifteenth century and the interrelationship between exploration and the development of European and non-European societies. (TW)

3391. History of World Religions (3:3:0). Introduction to religious ideas and institutions and their relevance to the development of contemporary secular ideas and institutions of the East and West. (TW)

3393. Survey of the Contemporary Far East (3:3:0). Studies Asia's modernization since the late 19th century and the interrelationship between the impacts of the West and the responses of various Asian countries. (TW)

3395. Survey of African History (3:3:0). A survey of African history from the early kingdoms to the rise and fulfillment of modern African nationalism. (TW)

3396. The Muslim World: From the Middle East to America (3:3:0). Islamic history from the creation of Islam through its growth into a world religion. Areas covered include Middle East, Africa, Spain, Iran, Indonesia, and America. (TW)

3397. Christianity, Islam, and Traditional Religion in Africa (3:3:0). African religious history focusing on traditional religions, Christianity, and Islam. Topics include the impact of the slave trade and the colonial conquest on African religious experience and the question of conversion to Christianity and Islam. (TW)

4301. English Colonial America to 1763 (3:3:0). Founding and development of the thirteen original colonies, political ideas and institutions, imperial policy, religion and society, origins of slavery, Anglo-French conflicts. (US)

4302. The American Revolutionary Era (3:3:0). American resistance to imperial power, the military struggle, constitutional developments in states and nation, social and cultural change, the new national political system. (US)

4303. The Age of Jefferson and Jackson, 1800-1848 (3:3:0). A chronological treatment of the period shaped by these two leaders, with attention to national expansion, political change, economic development, reform, and sectional controversy. (US)

4304. Civil War and Reconstruction, 1850-1877 (3:3:0). Explores the causes of the Civil War; the military, political, economic, and social aspects of the war; and the issues and results of Reconstruction. (US)

4305. The Emergence of Modern United States, 1877 to 1919 (3:3:0). The course focuses on the economic, social, political, and diplomatic impact of the transformation of the United States from an agrarian to an industrial nation. (US)

4306. Roaring Twenties, Depression, and War, 1920-1945 (3:3:0). Examines political, social, economic, and military developments in the United States during the 1920's, the Great Depression, the New Deal, and World War II. (US)

4307. The United States, 1945 to the Present (3:3:0). The study of American society from the Second World War through the 1970's, including political developments, wars, and cultural conflicts. (US)

4311. The American Frontier in the Trans-Appalachian East (3:3:0). Traces development of first American frontiers, colonial times to mid-nineteenth century, with emphasis on European origins, settlement of old Northwest and Southwest, and Indian-white relations. (US)

4312. The American Frontier in the Trans-Mississippi West (3:3:0). Explores the settlement of the American West to 1900, with emphasis on trapping, mining, transportation and farming frontiers, Spanish borderlands, and Indian-United States relations. (US)

4313. The Old South (3:3:0). Explores the society, politics, economics, and race relations of the antebellum South, the development of sectionalism, and the impact of the Civil War. (US)

4314. The South since the Civil War (3:3:0). Explores the degree to which the South has remained a separate region socially, politically, economically, and in race relations from Reconstruction to the present. (US)

4320. American Urban History (3:3:0). Study of urban growth from the colonies through contemporary America. Emphasis placed on the dynamics of urbanization and the role of cities in American history. (US)

4321. Social and Cultural History of the United States to 1865 (3:3:0). A survey describing the development of our social institutions such as religion, education, and family life from colonial times to the mid-nineteenth century. (US)

4322. Social and Cultural History of the United States since 1865 (3:3:0). A continuation of HIST 4321 investigating the shift of our social institutions from an agrarian society to our urban-industrial one into the present. (US)

4323. Women in American History: Selected Topics (3:3:0). Prerequisite: HIST 2300 and 2301, or 3323. Allows further exploration of selected topics in U.S. women's history. May be repeated for credit as topics vary. (US)

4324. Mexican Immigration to the United States: 1900 to the Present (3:3:0). Mexican immigration with emphasis on the relationship between economic cycles in the United States and the accommodation-rejection of the Mexican immigrant, the border as an interdependent social-economic system, and the undocumented worker. (US)

4326. The Plains Indians (3:3:0). Culture and history of the Plains Indians; cultural developments prior to contact with the Whites; Plains Indians-White relations; Plains Indians in the twentieth century. (US)

4327. American Intellectual History (3:3:0). Explores the impact of major ideas in American history. Topics include Puritanism, Social Darwinism, Freudianism, mysticism, the counter-culture, reform, and equality. (US)

4328. History of Religion in America (3:3:0). Traces the development of religious groups in America, colonial times to the present. Beliefs and interaction with society emphasized. (US)

4329. Constitutional History of the United States to 1865 (3:3:0). The constitutional development of the United States through the Marshall and Taney courts. Special emphasis on human and property rights. (US)

4330. Constitutional History of the United States since 1865 (3:3:0). Continues the constitutional development of the United States from the Civil War era through current times. Monitors contemporary Supreme Court activities. (US)

4331. Diplomatic History of the U.S. to 1914 (3:3:0). Examines American diplomacy and foreign policy from their colonial origins through the process of America's growth to world power status. (US)

4332. Diplomatic History of the U.S. since 1914 (3:3:0). Examines American diplomacy and foreign policy during the twentieth century with emphasis on the origins of contemporary U.S. foreign policy and diplomacy. (US)

4333. History of American Science (3:3:0). The social relations of science, its politics, and its relationship with American technology since 1600 are explored. No special scientific or technical preparation is expected. (US)

4336. Cattle Ranching in America (3:3:0). The development of beef production in the American colonies, its movement westward, and its transition into a major industry of the twentieth century. (US)

4338. Economic History of the United States to 1865 (3:3:0). Thematic treatment of American economic development from colonial times through the Civil War. Examines first industries, transportation, banking, labor, slave system, and public policy. (US)

4339. Economic History of the United States since 1865 (3:3:0). Rise of an urban, industrial economy in America from the Civil War to the present. Origins of big business, unions, Great Depression, and government regulation. (US)

4341. Ancient Greece (3:3:0). From the origins of classical Greek civilization to the Roman conquest. Tyranny and democracy, imperialism, the Hellenistic age. (E)

4342. Ancient Rome (3:3:0). Empire and the consequences: from the origins of the Republic through the partial collapse of the Empire in the fifth century A.D. Christianity and the Empire. (E)

4344. Origins of Christianity (3:3:0). Judaic and Hellenistic background of Christianity. Development of the faith from Jesus and Paul through the early fifth century. The Church and the Roman Empire. (E)

4345. Roman Law (3:3:0). The historical development of Roman law from the early republic through the age of the great imperial jurists. (E)

4347. History of the Medieval Church (3:3:0). Origins of the Roman Church, the papacy, monasticism, scholastic and mystical theology, church-state relations, and the decline of medieval Christendom. (E)

4348. The Renaissance (3:3:0). Cultural and political history of Italy, France, and England between 1300-1600; the "rebirth" of wisdom through art, architecture, literature, music, economics, and religion. (E)

4349. The Protestant Reformation (3:3:0). Europe 1517-1648. Religious revolt and the establishment of Protestantism; the age of religious wars; attempts at religious peace. (E)

4353. The French Revolution and Napoleon (3:3:0). The Old Regime and the Enlightenment. The Revolution, its drama, ideas, events, personalities, and complexities. Napoleon: heir, paladin, or liquidator of the Revolution? (E)

4354. Emerging Modern Europe, 1815-1914 (3:3:0). Restoration Europe. Revolutions of 1848. Mid-century "isms." Unifications of Italy, Germany, National histories, 1870-1914. Imperialism. End-of-century "isms." World War I origins. (E)

4357. Modern European Social Movements: Socialism, Communism, Anarchism, Fascism (3:3:0). Theory and practice of anti-status quo movements in nineteenth and twentieth century Europe. (E)

4358. Twentieth Century Europe (3:3:0). Survey European history from the immediate origins of World War I to the present. (E)

4361. Eastern Europe: 1867 to the End of the First World War (3:3:0). Political, economic, cultural, social development of the nationalities of the Austrian Empire, how and why the empire ended and the present Eastern European countries appeared. (E)

4362. Tsarist Russia (3:3:0). Political, economic, cultural and social development, and territorial expansion of Russia from earliest times to the beginning of the twentieth century. (E)

4363. Revolutionary Russia, 1894 to 1924 (3:3:0). The decline of Tsarist Russia, growth of a revolutionary movement, events and consequences of the Revolutions of 1905 and 1917 and of the Civil War. (E)

4364. History of Soviet Russia (3:3:0). The effects of Communist rule on the peoples of the USSR, and the Soviet Union's impact on the world in the twentieth century. (E)

4370. Tudor England (3:3:0). Describes England's role in the Protestant Reformation, overseas discovery, and the building of nation states, all highlighted by the personalities of the Tudor monarchs. (E)

4371. Stuart England (3:3:0). A study of England's century of revolution, not only in politics and government, but in religion, thought, and popular outlook. (E)

4372. Constitutional History of England to 1485 (3:3:0). Traces the development of constitutional institutions, principally parliament and the common law, through the end of the Middle Ages. (E)

4373. Constitutional History of England since 1485 (3:3:0). Traces the development of constitutional institutions and practices, such as common law and parliament, during the modern period. (E)

4381. Colonial Mexico and the Spanish Borderlands (3:3:0). Study of the Spanish conquest of Mexico and the evolution of the Spanish Empire in North America until Mexican independence in 1821. (TW)

4382. Mexico Since Independence (3:3:0). History of the Mexican nation from 1821 until the present, with emphasis on twentieth century developments including the Revolution of 1910 and its effects. (TW)

4384. History of Brazil (3:3:0). Brazil from preconquest times down to the present with emphasis on unique characteristics of Brazilian culture in the context of world history. (TW)

4385. Revolution and War in Latin America (3:3:0). Examines the element of violence as a factor in the culture and historical evolution of Latin America. (TW)

4386. Dictatorship in Latin America (3:3:0). Explores the causes for the prevalence of authoritarian government in Latin America and examines the various forms of dictatorship. (TW)

4387. Contemporary Issues in Latin America (3:3:0). An examination of contemporary Latin America in which historical perspective is brought to bear through ideological and theme emphasis. (TW)

4390. The British Empire, 1783 to Present (3:3:0). Studies the growth of the British Empire in the nineteenth century and its later decline in the twentieth century under the impact of war and nationalism. (TW)

4393. Modern China, 1842 to the Present (3:3:0). The Western encroachment on China and China's struggle for survival through rebellions, reforms, revolutions, and wars, both internal and external, and the rise of communism. (TW)

4394. Modern Japan, 1868 to the Present (3:3:0). The Western impact on Japan's modernization with emphasis on Japan's responses to the Western challenges and America's role in reconstructing Japan after World War II. (TW)

4395. Race and Class Conflict in South Africa (3:3:0). Regional history concentrating on the origins of apartheid, the policy of rigid separation by race. Topics include Southern Africa before the Europeans, African resistance, and the Black consciousness movement. (TW)

4397. Senior Honors (3). Prerequisite: Senior standing and consent of instructor. Includes research methods, bibliography, thesis writing.

4398. Senior Seminar in History (3:3:0). Prerequisite: Senior standing or completion of 18 hours in history. Required of history majors. An intensive study in historical methodology, document analysis, retrieval and collection of data, and synthesis into well-written history.

4399. Studies in Major Historical Issues (3:3:0). Research in selected topics. May count as US, E, or TW and be repeated for credit as topics vary.

Department of Mass Communications

Professor Billy I. Ross, Chairperson.

Professors Hsia and Tan; Associate Professors Dean, Harp, Hudson, Morgan, and Rooker; Assistant Professors Buchholz, McVay, Rainey, Thornhill, Umphrey, Wardrip, and Womack; Lecturers Haynes, Kinghorn, Lytle, Marra, Norman, and Whitfield; Visiting Assistant Professors Benson and Dillard; Part-time Instructors Arthur and Wilson.

This department supervises the following degree programs: *Bachelor of Arts* in JOURNALISM, ADVERTISING, TELECOMMUNICATIONS, and PHOTOCOMMUNICATIONS; *Master of Arts* in MASS COMMUNICATIONS.

Journalism (news-editorial), advertising, telecommunications, public relations, and professional graduate areas are accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC).

The department operates under the general policy of the ACEJMC which emphasizes the need to establish and preserve a 75/25 ratio between courses in liberal arts and sciences (75 percent of total hours taken) and professional courses (25 percent of total hours taken). The 75/25 ratio is applied to the 125 semester hours required in the College of Arts and Sciences for graduation (32 hours in departmental courses).

In order to keep the curriculum abreast of trends and changes in mass communications and to broaden the education of majors by requiring core subjects such as principles, law, and mass communications theory, the minimum number of semester hours required by the department for the Bachelor of Arts degree has been set at 132 hours with a corresponding maximum number of hours which can be taken in departmental courses being set at 36-39 hours.

Students registering in or transferring into the department for the first time will be designated as general mass communications students.

When the following requirements have been met the student will be transferred into the specific major:

1. Completed the ACT examination with scores submitted to the department.
2. Made at least a C in ENGL 1300 (if required), 1301, and 1302.
3. Demonstrated ability to type. Forty words per minute required with 70 percent accuracy.
4. Completed the entry level class in the major field (advertising, journalism, photocommunications, telecommunications) with a grade of C or higher. The entry level course for journalism is JOUR 2300 or 3310. The entry level course for advertising is ADV 3310. The entry level course for telecommunications is TELE 3310; for photocommunications, PHOT 2301. (In the case of transfer students, entry level will be the first course in the major taken at Texas Tech.)
5. At the time the general mass communications designation is changed to a major in journalism or advertising or telecommunications, or photocommunications, the student must have at least an overall 2.0 grade-point average.

All majors in the department must take the following department core courses: MCOM 3300, 4320, ADV 3310, JOUR 3309 or 3310, TELE 3310.

Undergraduate majors or minors must have a C or higher grade in all courses taken within the department. Any D grade in a required major or minor course must be repeated before taking any additional courses in the major or minor. A grade of C or higher is required for all transfer courses in a major or minor area.

Sophomore standing (at least 32 hours) is required for entry into 3000-level courses in the department if prerequisites are not stated.

Junior standing (at least 64 hours) is required for all 4000-level courses in the department if prerequisites are not stated.

All majors must select a minor outside the department with a minimum of 18 semester hours, 6 of which must be on the junior, senior (3000-4000) level.

In the English requirement of the General Degree Requirements, mass communications majors must take 12 hours of English without substitution for the final 3 hours from other areas.

Journalism Major. Students majoring in news-editorial (journalism) are required to complete 36-39 semester hours within the department, including the following courses: JOUR 2300, 3310, 3312, 4370, 4480, MCOM 3300, 4320, ADV 3310, and TELE 3310.

Also required are ECO 2305, which will satisfy part of the social science requirement, and MATH 2300, which will satisfy part of the mathematics requirement.

Students must be able to type 40 words per minute before enrolling in writing courses.

Journalism Curriculum.

First Year	Second Year	Third Year	Fourth Year
	News-Editorial Specialization		
MCOM 1300*	JOUR 3310, 3312	MCOM 3300, 4320	JOUR 4370, 4480
JOUR 2300	ECO 2305	TELE 3310	Mass Comm. elect.
	MATH 2300	ADV 3310	
	Broadcast Specialization		
MCOM 1300*	JOUR 3310, 3312	JOUR 3314	JOUR 4370
JOUR 2300	TELE 3310	MCOM 3300	TELE 4380, 4390
	ECO 2305	ADV 3310	MCOM 4320
	MATH 2300	TELE 3350	
	Public Relations Specialization		
MCOM 1300*	ADV 3310	JOUR 3335	JOUR 4480
JOUR 2300	JOUR 3310, 3312	ADV 3311	ADV 4314
	PHOT 2301	MKT 3350	MCOM 4320
	MATH 2300	SCOM 3308	
	ECO 2305	MCOM 3300	
	TELE 3310		

*Optional.

Advertising Curriculum.

First Year	Second Year	Third Year	Fourth Year
	Advertising Specialization		
MCOM 1300*	MATH 2300	ADV 3351, 3361	ADV 4312, 4316
ART 1370 or 3350	TELE 3310	MKT 3350, 3356	MCOM 4320
ECO 2305	ADV 3310	Mass Comm. elect.	Mass. Comm. elect.
MATH 1320 or 1330	MCOM 3300		
	JOUR 3309		
	Public Relations Specialization		
MCOM 1300*	MATH 2300	ADV 3351, 3361	ADV 4314
ART 1370 or 3350	JOUR 3310, 3312	JOUR 3335	MGT 3370
ECO 2305	ADV 3310, 3311	MKT 3350, 3356	MCOM 4320
MATH 1320 or 1330	MCOM 3300	TELE 3310	SCOM 3308
			Mass Comm. elect.

*Optional.

Advertising Major. Students majoring in advertising are required to complete 36-39 semester hours within the department, including the following courses: ADV 3310, 3351, 3361, 4312, 4316, JOUR 3309 or 3310, TELE 3310, MCOM 3300, 4320.

Also required are ART 1370 or 3350, ECO 2305, MATH 1320 or 1330, MATH 2300 (with a grade of C or higher), MKT 3350, 3356. ART 1370 and ECO 2305 will partially satisfy the humanities and social science requirements.

Students must be able to type 40 words per minute before enrolling in writing courses.

Telecommunications Curriculum.

First Year	Second Year	Third Year	Fourth Year
	Telecommunications Specialization		
MCOM 1300*	TELE 3310 ADV 3310 JOUR 3309 or 3310 MCOM 3300	TELE 3340 Mass Comm. elect.	TELE 4320 MCOM 4320 Mass Comm. elect.
	Noncommercial Telecommunications Specialization		
MCOM 1300*	TELE 3310 JOUR 3309 or 3310 ADV 3310 MCOM 3300 C S 1300	TELE 3100, 3360 PHOT 2301 Mass Comm. elect.	TELE 3100, 4360 MCOM 4320 Mass Comm. elect. EDCI 4323 MGT 3373 EPSY 3330

*Optional.

Telecommunications Major. Students majoring in telecommunications are required to complete 36-39 semester hours within the department, including the following courses: TELE 3310, 3340, 4320, MCOM 3300, 4320, ADV 3310, and JOUR 3309 or 3310.

Also required are ECO 2305, which will satisfy part of the social science requirement, and MATH 2300, which will satisfy part of the mathematics requirement.

Students must be able to type 40 words per minute before enrolling in writing courses.

Photocommunications Curriculum.

First Year	Second Year	Third Year	Fourth Year
ART 1320 ECO 2305	PHOT 2301, 3302 TELE 3310 MATH 2300	PHOT 3303 MCOM 3300 ADV 3310 JOUR 3310, 3312 ART 3326	PHOT 4300, 4301, 4303 MCOM 4320 Mass Comm. elect.

Photocommunications Major. Students majoring in photocommunications are required to complete 36-39 semester hours within the department, including the following courses: PHOT 2301, 3302, 3303, 4301, 4303; TELE 3310; ADV 3310; JOUR 3310, 3312; MCOM 3300, 4320.

Also required are ECO 2305, which satisfies part of the social science requirement; MATH 2300, which satisfies part of the mathematics requirement; and ART 1320, 3326, which partially satisfy the humanities requirement.

Students must be able to type 40 words per minute before enrolling in writing courses.

Broadcast Journalism. Students in this specialization are enrolled as journalism majors and are required to complete 36-39 semester hours within the department, including the following courses: JOUR 2300, 3310, 3312, 3314, 4370, TELE 3310, 3350, 4380, 4390, MCOM 3300, 4320, ADV 3310. Also required are ECO 2305 and MATH 2300.

Noncommercial Telecommunications. Students in this specialization are enrolled as telecommunications majors and are required to complete 36-39 semester hours within the department, including the following courses: TELE 3100 (twice), 3310, 3360, 4360, PHOT 2301, MCOM 3300, 4320, ADV 3310, JOUR 3309 or 3310. Also required are ECO 2305, MATH 2300, C S 1300, EDCI 4323, MGT 3373, and EPSY 3330.

Public Relations — Journalism. Students in this specialization are required to complete 36-39 semester hours within the department, including the following courses: JOUR 2300, 3310, 3312, 3335, 4480, ADV 3310, 3311, 4314, TELE 3310, PHOT 2301, MCOM 3300, 4320. Also required are MKT 3350, SCOM 3308, ECO 2305, and MATH 2300.

Public Relations — Advertising. Students in this specialization are required to complete 36-39 semester hours within the department, including the following courses: ADV 3310, 3311, 3351, 3361, 4314, JOUR 3310, 3312, 3335, TELE 3310, MCOM 3300, 4320.

Also required are ART 1370 or 3350, ECO 2305, MATH 1320 or 1330, MATH 2300 (with a grade of C or higher), MKT 3350, 3356, MGT 3370, SCOM 3308. ART 1370 and ECO 2305 will partially satisfy the humanities and social sciences requirements.

Students must be able to type 40 words per minute before enrolling in writing courses.

Teacher Education. In the teacher education program the department offers work in a teaching field in journalism (Plan I) for those planning careers in the secondary schools. A total of 28 hours is necessary to fulfill requirements with 22 hours in required courses plus 6 hours of electives from within the department.

The following courses constitute the required courses from the journalism secondary teaching field (Plan I): JOUR 2300, 3310, 3312, 4310, 4320, 4480, PHOT 2301.

Students must confer with the teacher education field advisor in the department before enrolling in courses.

Minors. A minor consisting of a minimum of 18 semester hours, which must include 6 hours of junior, senior level courses, is available in journalism, advertising, telecommunications, photocommunications, public relations, and mass communications. Specific requirements include:

Mass Communications: MCOM 3300, 4320, ADV 3310, TELE 3310, JOUR 3309, and 3 hours of electives.

Journalism: JOUR 3310, 3312, 4480, and 8 hours of electives from journalism courses, 3 hours of which must be junior or senior level.

Advertising: ADV 3310, 3351, 3361, 4312, 4316, and 3 hours of electives from advertising courses.

Telecommunications: TELE 3310, 3340, 4320, and 9 hours of electives from telecommunications courses.

Photocommunications: PHOT 2301, 3302, 3303, 4300, 4303, and 3 hours of electives from photography courses.

Public Relations: JOUR 3309, 3335, ADV 3310, 3311, 4314, and 3 hours of electives.

Courses in Mass Communications. (MCOM)

1300. Introduction to Mass Communications (3:3:0). A broad survey of communications in modern life with particular emphasis on print media, broadcasting, advertising, and public relations.

2210. Principles of Creativity in Mass Communications (2:2:0). A survey of the findings on the process of creativity, characteristics of the creative, identification and measurement of creativity, and techniques of improving creative abilities.

3300. Theories of Mass Communications (3:3:0). Prerequisite: Sophomore standing. An analysis of mass communications from the standpoint of the major theoretical approaches, including source, message, and receiver analysis; social effects; groups and communication networks; the mass media and political socialization; aggression and television violence.

4100. Special Problems in Mass Communications (1). Prerequisite: Consent of instructor. Individual research on approved problems in mass communications areas. May be repeated for 3 hours credit.

4320. Law of Mass Communications (3:3:0). A study of the legal problems facing journalists, broadcasters, and advertisers, including libel, privacy, regulation of radio-tv, fairness doctrine, and commercial speech.

4380. Mass Communications Survey Methods (3:3:0). Introduces the student to basic public opinion survey and research methodology and designs. Emphasis is on empirical survey techniques, administration, and procedure.

4390. Seminar in Mass Communications (3:3:0). Prerequisite: Senior standing. A seminar in problems of mass communications.

Courses in Journalism. (JOUR)

2300. Principles of Journalism (3:3:0). An overview of the broad field of journalism for journalism and nonjournalism majors. Extensive use of current literature as springboards for discussion of trends, movements, and principles of journalism.

3309. Writing for the Mass Media (3:2:3). Principles and practice of writing for major types of mass communications media. For nonmajors only. Typing 40 wpm required.

3310. News Writing (3:2:3). Prerequisite: Sophomore standing. The evaluation of news; news gathering methods and problems; discussion and exercises in writing leads, organizing stories, overcoming grammatical and structural problems; control lab. Students must have made at least a C in ENGL 1300 (if required), 1301, and 1302. Typing 40 wpm required.

3312. Reporting (3:2:4). Prerequisite: JOUR 3310 and sophomore standing. Discussion and practice in interviewing, reporting and writing of various types of stories including meetings, conventions, accidents, and other general news stories. Typing 40 wpm required.

3314. Broadcast Journalism (3:2:3). Prerequisite: JOUR 3310 or consent of instructor. The study and practice of writing and editing news for radio and television. Emphasis on the principles, techniques, and forms of broadcast communication. Typing 40 wpm required.

3316. Magazine Writing (3:3:0). A study of the scope, influence, and responsibilities of the magazine as a cultural and social force. Survey of editorial problems; intensive writing practice and emphasis on marketing magazine articles. Typing 40 wpm required.

3317. Magazine Editing and Design (3:3:0). Covers the production of magazines from the selection and editing of copy and art, copy fitting, type selection, layout and design of magazines, including problems and variations involved in each step, to the culmination of publishing the *Exordium*, a student magazine. Typing 40 wpm required.

3335. Public Relations of Administration (3:2:3). Prerequisite: ADV 3311; JOUR 3309 and 3310 or 3312; or consent of instructor. A course emphasizing methods and techniques of public relations communications and problem solving. Typing 40 wpm required.

3350. History of American Journalism (3:3:0). Study of the development of journalism in America from its European roots to the present and of its interrelation with society.

3390. Internship in Journalism (3). Prerequisite: Junior standing and JOUR 3310 and 3312. Professional work in a mass medium. Performing staff functions in journalism under faculty adviser and on-site supervisor. At least 8 weeks full-time employment required.

4300. Individual Study in Journalism or Public Relations (3). Prerequisite: Senior standing, 9 hours of journalism courses, and consent of instructor prior to registration.

4310. Directing School Publications (3:3:0). Prerequisite: JOUR 3310, 3312, and 4480 — for secondary education majors using journalism as a teaching field. No prerequisite for broad-field English students. Study of the methods and procedures of producing school publications. Problems related to staff organization, personnel instruction, editorial supervision, advertising sales, business management, promotion, and production. Role of school publications and the school administration.

4320. Journalism for the High School Teacher (3:3:0). A study of the methods and philosophies of teaching journalism and supervising student publications in the secondary school. May be counted as an education elective by other secondary education students.

4330. Public Opinion and Propaganda (3:3:0). The nature of public opinion and propaganda; the role of the press in its formation and how the press is influenced by public opinion.

4370. Public Affairs Reporting (3:2:3). Prerequisite: JOUR 3310, 3312. A course in the interrelation and writing of news on social, political, and economic topics. Lecture discussions implemented through off-campus laboratory assignments. Typing 40 wpm required.

4480. Editing (4:3:3). Prerequisite: JOUR 3310, 3312. Study of purposes and methods of preparing newspaper copy for publication, including extensive study and practice in headline writing and editing. Attention to new technological advances such as OCR and CRT. Typing 40 wpm required.

Courses in Advertising. (ADV)

3160. Special Studies in Advertising (1:1:0). Prerequisite: ADV 3351 or consent of instructor. Offered in three five-week segments per semester. Students may take one or more topics for a maximum of three credit hours.

3310. Principles of Advertising (3:3:0). Prerequisite: Sophomore standing. An overview of the broad field of advertising. Acquaints students with the role of advertising in the American economy and social system and the procedures involved in planning advertising campaigns.

3311. Principles of Public Relations (3:3:0). Prerequisite: Sophomore standing. A study of the policies and procedures of creating and maintaining good will among organizations' various publics. Examines the many aspects of public relations as a staff and management function.

3351. Advertising Media Planning (3:2:3). Prerequisite: ADV 3310 or MKT 4354 and MATH 2300 (with a grade of C or higher) or consent of instructor. A study of the various advertising media to provide students with a knowledge of the use of advertising media, methods of selection, and the skills and background required for media buying.

3355. Media Sales (3:3:0). Prerequisite: ADV 3351 or consent of instructor. Study of the economics, strategies, and techniques involved in print and electronic media sales.

3361. Advertising Creative Strategy (3:2:3). Prerequisite: ADV 3310 or MKT 4354 and JOUR 3309 or 3310, or consent of instructor. Must be taken after or concurrently with ADV 3351. Analysis of the creative aspects of advertising; strategy, copy, layout, typography, and production. Provides practical application of how to plan and execute effective print and broadcast messages.

3366. Radio and Television Advertising (3:2:3). Prerequisite: ADV 3310 or MKT 4354 or consent of instructor. In-depth study of the electronic means of mass communications for persuasive promotion of ideas, goods, and services. Emphasis on principles, procedures, and techniques employed in the creation of broadcast copy.

3390. Internship in Advertising (3). Prerequisite: ADV 3351, 3361, and consent of instructor. Supervised work in media or communications organization. Minimum of 8 weeks full-time employment. Weekly reports and term paper approved by employer and instructor required.

4300. Individual Study in Advertising or Public Relations (3). Prerequisite: Senior standing, 9 hours of advertising and/or public relations courses, and consent of instructor prior to registration. May be repeated for credit.

4304. Advanced Creative Strategy (3:3:0). Prerequisite: ADV 3361 and consent of instructor. Advanced formulation and techniques of creative strategy with emphasis on copywriting. Includes participation in local, state, regional, and/or national advertising competitions.

4312. Advertising Research and Campaigns (3:2:3). Prerequisite: ADV 3361 and 3351 or consent of instructor. Introduction to advertising research; methods of message and media research techniques with special application to campaign planning. Basic principles and applications of advertising campaign planning, preparation, and presentation taught in a problem-solving mode.

4313. International Advertising (3:3:0). A study of the practices and procedures of advertising on the international market.

4314. Public Relations Cases and Problems (3:3:0). Prerequisite: Completion of required courses; should be taken during final long semester. Application of the principles and theories of public relations to the problems of public and private institutions. Emphasis on contemporary problems of public relations.

4316. Advertising Administration (3:3:0). Prerequisite: Completion of all required courses (should be taken during the final long semester). Use of the problem-solving approach to management problems in advertising through cases, research projects, special reports, and readings.

Courses in Telecommunications. (TELE)

3100. Telecommunications Activities (1:0:3). Prerequisite: TELE 3310. Laboratory in radio-television activities; limited to 2 hours for majors and minors; 1 hour for others. Must be taken pass-fail.

3310. Introduction to Telecommunications (3:3:0). Prerequisite: Sophomore standing. Basic instruction in the origin, history, development, regulation, and social responsibilities of broadcasting and cable communications. Examines new technology and telecommunications systems.

3320. Radio Production (3:2:3). Prerequisite: TELE 3310 or consent of instructor. Principles and techniques for the operation of a radio control room. Opportunity to acquire professional facility in the direction and production of radio broadcast materials for KTXT-FM.

3330. Television Production (3:2:3). Prerequisite: TELE 3310. A concentrated course in the theory and application of principles, procedures, and techniques of television studio production.

3340. Broadcast Programming and Promotion (3:3:0). Prerequisite: TELE 3310 or consent of instructor. A comprehensive study of radio and television program design, audience analysis, and current programming practices and promotions.

3350. Broadcast Performing and Reporting (3:2:3). Prerequisite: TELE 3310 or consent of instructor. A concentrated course in the theory and practice of the multiple duties, responsibilities, and opportunities of the announcer/news reporter.

3360. Writing for Noncommercial Media (3:3:0). Development of principles and practice in writing for noncommercial media. Emphasis on slide/tape and video program research, proposals, budgets, treatments, and script writing.

3370. Radio and Television Writing (3:2:3). Prerequisite: TELE 3310. A comprehensive study to develop both cognitive and skill processes in the writing of continuity and public affairs material for KTXT-FM.

3390. Internship in Telecommunications (3). Prerequisite: Consent of instructor. Supervised professional work in media or communications organization. Minimum of 8 weeks full-time salaried employment. Weekly reports and term paper approved by employer and instructor required.

4300. Senior Projects in Telecommunications (3). Prerequisite: Senior standing, 9 hours in area in which project is to be pursued, and consent of instructor prior to registration. May be repeated once for credit.

4320. Problems in Broadcast Operations (3:3:0). Prerequisite: 12 hours in mass communications and senior standing. An analytical study of the legal, economic, operational, sales, and policy factors of station organization and administration. Case studies and individual projects.

4330. Advanced Television Production and Directing (3:2:3). Prerequisite: TELE 3330. The preparation and directing of television programs with emphasis on the creative application of broadcasting principles and informational techniques. Field production and video editing.

4360. Noncommercial Telecommunications (3:3:0). Prerequisite: TELE 3360. Telecommunications systems utilized by industry, business, medicine, education, and military. Emphasis on software development and trends in noncommercial communications. Evaluation of instructional and informational programs.

4380. Broadcast Features and Documentaries (3:2:3). Prerequisite: JOUR 3314 or consent of instructor. Broadcast journalism techniques in writing and producing television features, documentaries, and related programming. Emphasis on pre/post-production activities from research to final video editing.

4390. Telecommunications Practicum (3). Prerequisite: TELE 3310, 3330 or JOUR 3314, senior standing in mass communications areas, and consent of instructor prior to registration. A supervised study opportunity is provided for the student to observe and analyze the methods, techniques, and creative processes of the media professional. Must be taken pass-fail.

Courses in Photography. (PHOT)

2301. Basic Photography (3:2:4). Prerequisite: Sophomore standing. Emphasizes practical assignments in photographic image making. Covers the areas of cameras, light meters, film and print processing and includes the application of flash, filters, and creative technique used in photography. Students should have access to a camera.

3302. Intermediate Photography (3:2:4). Prerequisite: PHOT 2301. A detailed study of the materials and processes of photography. Emphasis on print and negative quality, composition, and elements of good photography.

3303. Advanced Photography (3:2:4). Prerequisite: PHOT 3302 or consent of instructor. A detailed study of photography with emphasis on print and negative quality, composition, and elements of good photography.

3305. Film (3:2:4). Prerequisite: PHOT 3302 or consent of instructor. A study of film theories with introduction in shooting of film, editing, film continuity, etc.

4300. Special Problems in Photography/Film (3). Prerequisite: PHOT 3303, senior standing, and consent of instructor. Individual investigation into the areas of television news, advertising, press photography, and film. May be repeated for credit in each area.

4301. Photojournalism (3:2:4). Prerequisite: PHOT 3302. Under supervision of photography faculty, student investigates the history of photojournalism. Laboratory work will include different forms of editorial and newspaper photography.

4303. Color Photography (3:2:4). Prerequisite: PHOT 3302. The theories of color negative film, color transparencies, color printing, filtration, and color analysis will be covered. Lab work will include development of negatives, transparencies, and prints.

Department of Mathematics

Associate Professor John T. White, Chairperson.

Professors Amir-Moez, Bennett, Chanda, Ford, Hildebrand, Hunt, T. Lewis, McLaughlin, Nelson, Newman, Riggs, and Tarwater; Associate Professors Anderson, Baldwin, Barnard, Davenport, Duran, Ebanks, Gustafson, Harris, Kellogg, W. Lewis, Miller, Mitra, Moreland, Shurbet, Strauss, Thompson, Victory, and Walling; Assistant Professors Ashton, Byerly, Dey, Drager, Foote, Fredricks, Gilliam, Kennedy, McCasland, Morton, Neill, Neta, Nguyen, Pearce, Scarino, Schovanec, Tsao, and Weinberg; Visiting Professor Martin.

This department supervises the following degree programs: MATHEMATICS, *Bachelor of Arts* or *Bachelor of Science, Master of Arts* or *Master of Science, Doctor of Philosophy;* STATISTICS, *Master of Science.* In addition, the department supervises programs leading to minors in mathematics and to teacher certification in mathematics at the elementary and secondary levels. Finally, the department offers certain courses in astronomy.

The curricula leading to the Bachelor of Arts or Bachelor of Science degrees follow the general patterns described in the Arts and Sciences section of this catalog. All major programs in mathematics require proficiency in calculus at the level of MATH 2350, plus MATH 2360, 3354, 3360, 4350 and at least one of MATH 4351, 4354, and 4360. In addition, candidates for the B.A. degree must take at least 6 hours of approved electives in mathematics at the 3000-level and above, while candidates for the B.S. degree must take at least 12 additional hours of approved electives in mathematics at the 3000-level and above. French, German, or Russian must be taken by the mathematics major to satisfy the foreign language degree requirement for the B.S. degree, and these languages are recommended for the B.A. degree.

For a major in mathematics, a student must have a grade of C or better in each course counted toward the degree.

All programs leading to an undergraduate degree in mathematics must be approved by the department's Director of Undergraduate Studies.

Candidates for the B.S. degree must choose their minor from the following: biology, botany, chemistry, computer science, economics, geosciences, microbiology, physics, or zoology. The student is strongly encouraged to select those courses within the minor field which are as mathematically oriented as possible. Advice in this regard can be secured from the minor department. A minor must include 18 semester hours, 6 of which must be advanced, and courses to be counted toward the minor must be approved by the minor department.

Candidates for the B.S. degree must complete a science requirement of at least 32 hours of science courses, including at least a full year in each of two laboratory sciences. These science courses must be chosen from the departments listed above as suitable for a minor in this degree program, and the laboratory science courses must be taken from biology, botany, chemistry, geosciences, microbiology, physical geography, physics, or zoology and must carry laboratory credit. Courses taken as part of the minor may also be used to fulfill this science requirement.

A minor in mathematics requires 18 semester hours, at least 6 of which must be at the 3000-level or above and must be approved by the Director of Undergraduate Studies. A typical minor sequence is MATH 1351, 1352, 2350, and 2360 plus 6 semester hours of approved courses at the 3000-level or above.

MATH 3350 and 3351 may be used as part of the minor program, but students cannot receive minor credit for both MATH 3350 and 3354. Students must receive a grade of at least C in all courses counted toward a minor in mathematics.

Teacher Education. The Department of Mathematics cooperates with the College of Education in offering plans for teacher certification in mathematics at both the elementary and the secondary school levels. The student preparing to teach in the secondary school may select mathematics as a teaching field and complete the program for teacher certification in mathematics for secondary education. The student preparing to teach in the elementary school may select mathematics as an area of academic specialization under Plan I (21 hours) or Plan II (24 hours) in elementary education. The student should consult the Department of Mathematics concerning teacher certification. A student must have a grade of C or better in each mathematics course counted toward elementary and secondary education certification.

The courses offered in mathematics for students intending to prepare themselves for elementary teaching are MATH 1370, 1371, 2370, 2371, 3370, 3371, 4370 and 4371. (MATH 1370 and 1371 will not satisfy mathematics requirements for other majors.)

The requirements for the teaching field in mathematics at the secondary level are:

(1) MATH 1351 and 1352 (See Guide for Initial Enrollment in Mathematics) and MATH 2350, 2360, and 4331;

(2) 9 additional hours to be chosen from MATH 3354, 3360, 4342, 4350, 4362; however, MATH 3360 and 4362 may not both be counted toward this 9-hour requirement.

Guide for Initial Enrollment in Mathematics.

Placement in freshman courses is made on the basis of a student's high school background, SAT (Mathematics) scores, and Mathematics Achievement Test (MAT) scores. Freshman mathematics majors are required to take the MAT.

The following list describes the mathematics courses most frequently taken by freshmen.

(1) MATH 1300 is designed for students of liberal arts whose program does not require specific mathematics courses.
MATH 1300 has no prerequisites.
Students who desire only to satisfy a 6-hour mathematics requirement and who take MATH 1300 as a first course should consider MATH 1320, 1321, or 1330 for the second course.

(2) MATH 1320 and 1321 are designed for students needing a proficiency in algebra and trigonometry.
MATH 1320 Prerequisites: reasonable training in high school algebra and geometry.
MATH 1321 Prerequisites: reasonable proficiency in algebra and geometry.

(3) MATH 1330 and 1331 are designed for students of business and other selected areas.
MATH 1330 Prerequisites: 4 semesters of high school algebra.

(4) MATH 1350, 1351, and 1352 (or MATH 1551 and 1552) are designed for students of mathematics, engineering, and physical sciences and for students in the secondary certification program.
MATH 1350 Prerequisites: 4 semesters of algebra, 2 semesters of geometry, 1 semester of trigonometry, and a score of 570 or better on the MAT or SATM.
MATH 1351 Prerequisites: 8 semesters of high school mathematics with an average grade of B or better including 1 semester of trigonometry and 1 semester of analytical geometry and a score of 620 or better on the MAT or SATM.
MATH 1551 Prerequisites: 4 semesters of algebra, 2 semesters of geometry, 1 semester of trigonometry, and a score of 570 or better on the MAT or SATM.
Students who plan on taking the above sequence of courses and who score less than 570 should enroll in MATH 1320 and 1321.

(5) MATH 1370 and 1371 are designed for students in elementary education and will not meet the mathematics requirements for other majors.

(6) MATH 1380 and 2380 are designed for students of biology. Biology majors in a premedical program will need both MATH 1380 and 2380.
MATH 1380 Prerequisites: 4 semesters of algebra and 2 semesters of geometry with an average grade of B or better, and a score of 550 or better on the SATM.

Courses in Mathematics. (MATH)

1300, 1301. Fundamentals of Mathematics I, II (3:3:0 each). This course is designed specifically for those students who will terminate their mathematical train-

ing with one or two courses in mathematics. Its main aim is to provide the student with sufficient mathematical literacy for participation in our present society.

1320. College Algebra (3:3:0). Prerequisite: Reasonable training in high school algebra and geometry. Inequalities; determinants; theory of equations; binomial theorem; progressions; mathematical induction.

1321. Trigonometry (3:3:0). Prerequisite: Reasonable proficiency in algebra and geometry. Trigonometric functions; radians; logarithms; solutions of triangles; identities; trigonometric equations; complex numbers; De Moivre's Theorem.

1330, 1331. Introductory Mathematical Analysis (3:3:0 each). Prerequisite: 4 semesters of high school algebra. Set theory; inequalities; equations, relations; functions; vectors; matrices; linear programming; probability; progressions; elementary calculus; mathematics of finance.

1350. Analytical Geometry (3:3:0). Prerequisite: Satisfactory placement test scores and knowledge of basic trigonometry or MATH 1320 and 1321. Fundamental concepts of analytical geometry. The sequence MATH 1350, 1351, 1352 is equivalent to the sequence MATH 1551, 1552.

1351. Calculus I (3:3:0). Prerequisite: MATH 1350 or 8 semesters of high school mathematics with an average grade of B or better including 1 semester of trigonometry and 1 semester of analytical geometry and a score of 620 or better on the MAT. Differentiation of algebraic functions, applications of the derivative, differentials, indefinite integrals, definite integrals. The sequence MATH 1350, 1351, 1352 is equivalent to the sequence MATH 1551, 1552. (Honors section offered.)

1352. Calculus II (3:3:0). Prerequisite: MATH 1351 or consent. Methods of integration, parametric equations, polar coordinates, hyperbolic functions, applications. The sequence MATH 1350, 1351, 1352 is equivalent to the sequence MATH 1551, 1552. (Honors section offered.)

1370, 1371. Fundamental Structure of Arithmetic for Elementary Teachers I, II (3:3:0 each). Fundamental operations and concepts of arithmetic; systems of numeration; relations and functions; measurements. May not be applied toward any Arts and Sciences degree.

1380. Mathematical Analysis and Calculus for the Life and Management Sciences I (3:3:1). Prerequisite: Three years of high school mathematics including 4 semesters of algebra and 2 semesters of geometry with an average grade of B. SATM score of 550 or better recommended. Introduction to linear algebra, probability, and differential calculus with applications to the life and management sciences.

1551. Analytical Geometry and Calculus I (5:5:0). Prerequisite: Satisfactory placement test scores. Introduction to analytical geometry; limits; the derivative; applications.

1552. Analytical Geometry and Calculus II (5:5:0). Prerequisite: MATH 1551. Logarithms; polar coordinates; parametric equations; formal integration; definite integrals; applications.

2300. Statistical Methods (3:3:0). Prerequisite: MATH 1320 or equivalent. Methods of analyzing data; statistical concepts and models; estimation; tests of significance; introduction to analysis of variance, linear regression, and correlation.

2322. Calculus for Engineering Technology I (3:3:0). Prerequisite: MATH 1320 and 1321. This course is intended for students of engineering technology and stresses the geometric and physical aspects of calculus.

2323. Calculus for Engineering Technology II (3:3:0). Prerequisite: MATH 2322. This course is a continuation of MATH 2322.

2350. Calculus III (3:3:0). Prerequisite: MATH 1352 or MATH 1552. Partial differentiation; functions of several variables; multiple integrals. (Honors section offered.)

2360. Linear Algebra (3:3:0). Prerequisite: MATH 1352 or MATH 1552. Finite-dimensional vector spaces; linear transformations and matrices; quadratic forms; eigenvalues and eigenvectors.

2370, 2371. Fundamental Algebra for Elementary Teachers I, II (3:3:0 each). Prerequisite: MATH 1371 or its equivalent. Topics in elementary number theory and modern algebra. May not be applied toward any Arts and Sciences degree.

2380. Mathematical Analysis and Calculus for the Life and Management Sciences II (3:3:1). Prerequisite: MATH 1380 or consent of instructor. Properties of derivatives; the integral calculus; trigonometric, logarithmic, and exponential functions; introduction to the calculus of several variables; applications to the life and management sciences.

3322. Higher Mathematics for Engineering Technology (3:3:0). Prerequisite: MATH 2323. Topics include differential equations, Laplace transform, Fourier series, and vector and matrix algebra.

3350. Higher Mathematics for Engineers and Scientists I (3:3:0). Prerequisite: MATH 2350 or concurrent registration with departmental consent. Ordinary differential equations. Laplace transforms. Other selected topics.

3351. Higher Mathematics for Engineers and Scientists II (3:3:0). Prerequisite: MATH 3350 or 3354. Partial differential equations. Other selected topics.

3354. Differential Equations I (3:3:0). Prerequisite: MATH 2350 and 2360. Solutions of ordinary differential equations; geometric and physical applications. MATH 3350 and 3354 may not both be counted toward a mathematics degree.

3360. Foundations of Algebra I (3:3:0). Prerequisite: MATH 2360. Fundamental concepts of abstract algebra.

3370. Geometry for Elementary Teachers (3:3:0). Prerequisite: MATH 1371 or equivalent. Congruence and measures of plane and solid figures; similarity; areas; volumes; coordinate geometry.

3371. Probability for Elementary Teachers (3:3:0). Prerequisite: MATH 1371 or equivalent. The nature, scope, and objectives of statistics; graphs; measures of central tendency and dispersion; elementary concepts and theorems of probability; random variables; distributions; expectation; the binomial probability distribution.

4310, 4312. Introduction to Numerical Analysis I, II (3:3:0 each). Prerequisite: MATH 3350 or 3354, including an elementary knowledge of programming or consent of instructor; MATH 4310 is not prerequisite to MATH 4312. Interpolation; approximations; numerical integration and differentiation; roots of polynomial equations; numerical linear algebra; solution of ordinary differential equations.

4331. Methods of Teaching Geometry in Secondary Schools (3:3:0). Prerequisite: MATH 2350 and 2360; this course should be taken prior to student teaching. Methods of teaching mathematics in the secondary schools using geometry as a model for studying methods.

4340. Probability (3:3:0). Prerequisite: MATH 1352 or 1552. Permutations and combinations; additive and multiplicative laws of probability; expectation; Bayes' theorem; continuous and discontinuous distribution functions; applications.

4342, 4343. Mathematical Statistics (3:3:0 each). Prerequisite: MATH 2350. Frequency functions; moments; probability; correlation and regression; testing hypotheses; small sample distributions; analysis of variance; nonparametric methods; sequential analysis.

4350, 4351. Advanced Calculus (3:3:0 each). Prerequisite: MATH 2350 (MATH 2360 recommended). Sets; functions; vector fields; partial derivatives; power series; theory of integration; line, surface, and multiple integrals.

4354. Differential Equations II (3:3:0). Prerequisite: MATH 3354. Partial differential equations and boundary value problems.

4356. Elementary Functions of Complex Variables (3:3:0). Prerequisite: MATH 2350. The complex number system; functions of a complex variable; differentiation; elementary functions; and contour integration.

4360. Foundations of Algebra II (3:3:0). Prerequisite: MATH 3360. Continuation of MATH 3360.

4362. Theory of Numbers (3:3:0). Prerequisite: MATH 1352 or 1552. Prime numbers; congruences; theorems of Fermat, Euler, and Wilson; residues; reciprocity law; Diophantine Equations.

4370. Analysis I for Elementary Teachers (3:3:0). Prerequisite: MATH 3370. Trigonometry, analytical geometry, calculus, and applications.

4371. Analysis II for Elementary Teachers (3:3:0). Prerequisite: MATH 4370. Continuation of MATH 4370.

4399. Selected Topics (3). Prerequisite: Consent of undergraduate program director. Selected topics in upper division mathematics. May be repeated for credit.

Courses in Astronomy. (ASTR)

1100. Survey of Astronomy (1:1:0). The main features of the known universe and the principles involved in their discovery. A nonmathematical survey.

2300, 2301. General Astronomy (3:3:0 each). Prerequisite: MATH 1321 or equivalent. The solar, stellar, and galactic systems studied with attention to technical details.

Department of Museum Science

Professor Clyde Jones, Chairperson.
Horn Professor Baker; Professor Drew; Assistant Professors Bradley, Chatterjee, Fredriksson, and Johnson.

This department directs the following degree program: MUSEUM SCIENCE, *Master of Arts*. Students may also elect to minor in museum science at both the master's and doctor's levels. Courses offered by the department as well as descriptions of the programs are contained in the *Graduate Catalog*.

Department of Music

Professor Harold T. Luce, Chairperson.
Professors Bailey, J. Barber, Brittin, Cutter, R. Deahl, Ellsworth, J. Gillas, Kellogg, Killion, Marple, Maynard, McCarty, Payne, Post, T. Redcay, Stoune, Sudduth, R. Tolley, and van Appledorn; Associate Professors G. Barber, Bogle, Follows, Gettel, Hartwell, Lehrman, McGowan, Meek, Shin, Thomas, Turner, Vaughan, Westney, and Wilson; Assistant Professors Arnold, Bearden, L. Deahl, Paxton, Redinger, Schoenfeld, and Tanner; Lecturers M. Gillas, M. Redcay, and B. Tolley.

This department supervises the following degree programs: PERFORMANCE, MUSIC HISTORY AND LITERATURE, MUSIC THEORY, *Bachelor of Music, Master of Music;* MUSIC COMPOSITION, *Bachelor of Music;* MUSIC, *Bachelor of Arts;* MUSIC EDUCATION, *Bachelor of Music Education, Master of Music Education;* FINE ARTS, *Doctor of Philosophy* with an option in Music. The department also participates in the ethnic studies and humanities minor programs. Graduate students are referred to the *Graduate Catalog*.

Courses for Nonmajors. Nonmusic majors may elect class or private instruction in voice or in any instrument subject to the availability of faculty. Students enrolled in applied music are carried at their maximum level of achievement, and the nonmusic major is not examined in competition with the music major. In addition to the above, courses designed to serve all students enrolled in

the University include all major ensembles such as Marching Band (fall only — M EN 1103, 3103, 3203); Symphonic and Varsity Bands (M EN 3103, 3203); Orchestra (M EN 3104, 3204); Tech Choir (M EN 3101, 3201); Tech Singers (M EN 3101); Music Theatre (M EN 3102, 3202), and Jazz Ensembles and Combos (M EN 3105). Auditions are required for some of these ensembles; check with the department office (742-2270) for information about auditions. All students may also participate in the various smaller ensembles (consult the schedule of classes under M EN 3106). Nonmusic majors may also enroll in major courses in music composition, music education, music literature, and music theory with the consent of the instructor.

Although nonmusic majors may enroll in any music department course, the following courses are designed specifically for nonmajors.

M AP 1223, 1224. *Semiautomatic Keyboard.* Beginning and intermediate class instruction in semiautomatic keyboard instruments.

M AP 2133, 2134. *Class Guitar.* Beginning and intermediate instruction in guitar; basic left and right hand approaches of classical technique; basic chords and accompaniment styles.

M CP 1201, 1202. *Music Composition.* Free composition in the smaller forms for piano, voice, solo instrument, or electronic media. May be an individual study course.

M LT 1308. *Music Appreciation.* Beginning course for nonmajors. Appreciation of music is encouraged through consideration of a variety of musical styles. Satisfies humanities requirement.

M LT 2308, 2309. *Heritage of Music.* Selected compositions will be studied through an interpretation of their historical, functional, and cultural significance. Satisfies fine arts or humanities degree requirement.

M LT 3304. *History of Jazz.* Historical and analytical survey of jazz from its beginning through "Rock"—its form, style, literature, and influence on 20th century music. Satisfies fine arts or humanities degree requirement.

M LT 3308. *Masterpieces in Music.* Representative musical works from the Baroque Period to the present are studied in relation to their historical and general cultural context. Satisfies fine arts or humanities degree requirement.

M TH 1301. *Introduction to Music Theory.* Special section for nonmajors. Emphasis on simple melody, rhythm, harmony, and song writing.

Music Programs. Minors in music are available in a variety of programs ranging from 18 to 24 semester hours; information is available in the Music Department office.

Students seeking the degree *Bachelor of Science in Education* with elementary certification, and with an academic specialization in music, must take the following in music:

Plan I

In addition to M ED 2301 and 3337 (substituted for M ED 2302) which are required specified courses in the academic specialization, the student will complete the following:

M ED 3221, 3222, 3330, 4337

Applied Music (keyboard or voice) and/or Ensemble: 8 semester hours (determined in consultation with the Music Department advisor during the sophomore year).

Plan II

In addition to M ED 2301, which is required as a specified course in the academic specialization, the student will complete the following:

M ED 3221, 3222, 3330, 3337, 4337

Applied Music (keyboard or voice) and/or Ensemble: 11 semester hours (determined in consultation with the Music Department advisor during the sophomore year).

Entering freshman music majors should have studied previously and should have attained technical proficiency in applied music sufficient to qualify for acceptance in a particular degree plan. Additional information about applied music is available from the Music Department. Graduation requirements in applied music vary according to the student's degree and major. All music students will have their work in their principal applied music studies periodically reviewed by the faculty.

Entering freshmen may receive credit for college-level work accomplished prior to entering the University. This may be done through advanced standing examinations administered by the faculty of the Department of Music after the student has obtained permission from the Dean of the College of Arts and Sciences during the first semester of the freshman year. Advanced standing examinations will be administered only in the fields of applied music and music theory. In order to receive credit by an advanced standing examination the student must achieve a grade of not less than B on such examination.

The student must earn a minimum grade of C to qualify for successive levels of freshman and sophomore theory.

All students whose principal instrument is not keyboard must demonstrate piano proficiency as determined by the department.

All students enrolled in keyboard must have practical experience in accompanying as designated by the Department of Music. All piano performance majors are required eight semesters of piano ensemble. Organ majors and students other than performance majors whose principal instrument is piano are required four semesters of piano ensemble.

All vocal music education majors must participate in chorus for eight semesters. All wind and percussion music education majors must participate in band for eight semesters; wind and percussion performance majors must play in a large ensemble for eight semesters and in a small ensemble for four semesters. All string music education majors must participate in orchestra for eight semesters; string performance majors must participate in orchestra for eight semesters and chamber music for six semesters. All guitar music education majors must participate in guitar ensemble for four semesters and in a large ensemble (band, choir, or orchestra) for four semesters. Guitar performance majors participate in guitar ensemble for six semesters, in chamber music for six semesters, and in a large ensemble for two semesters.

Recital Requirements. Candidates for music education, music history and literature, or performance degrees are required to present a ½ length recital. In addition, performance majors are required to present a full length senior recital. Piano performance majors with pedagogy emphasis are required to present a ¾

length recital. Piano performance majors with chamber music and accompanying emphasis are required to present four recitals of standard accompaniment and chamber music repertoire. Permission to present each recital must be obtained from an examining jury at least two weeks prior to the recital.

Music composition majors are required to present a recital of their original compositions during the senior year. Permission to present the recital must be obtained from the composition faculty one semester prior to the recital.

All music majors must enroll for MUS 2101, Music in Performance, for six consecutive semesters beginning with the first semester of the freshman year.

Courses in Applied Music. Additional fees for applied music are shown in this catalog under Miscellaneous Special Fees. Laboratory hours shown for applied music courses are student-teacher contact hours. Applied music students are required to practice a minimum of 3 clock hours per week for each semester-hour credit.

Following are several recommended curricula in music. The tables are provided as a convenience to students and advisors. Please refer to the Arts and Sciences section of the catalog for general degree requirements. All music majors plan their individual courses of study in consultation with a faculty advisor.

Performance — Piano Curriculum.*

FIRST YEAR

Fall		*Spring*	
M AP 1105, Keyboard Skills	1	M AP 1106, Keyboard Skills	1
M AP 1001, Piano	4	M AP 1002, Piano	4
M LT 1301, Intro. Mus. Lit.	3	M LT 1302, Intro. Mus. Lit.	3
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
M EN 3106-1, Accompanying	1	M EN 3106-1, Accompanying	1
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	18		18

SECOND YEAR

Fall		*Spring*	
M AP 2105, Keyboard Skills	1	M AP 2106, Keyboard Skills	1
M AP 2001, Piano	4	M AP 2002, Piano	4
M TH 2403, Intermed. Theory	4	M TH 2404, Intermed. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 2301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.**	3
M LT 2301, Hist. of Music	3	M LT 2302, Hist. of Music	3
M EN 3106-1, Accompanying	1	M EN 3106-1, Accompanying	1
	17		17

THIRD YEAR

Fall		*Spring*	
M AP 3001, Piano	4	M AP 3002, Piano	4
M TH 3303, Form, Anal. & Synth.	3	Mus. Theory or Mus. Lit. elective	3
M ED 3207, Ch. Meths. & Techs. or M ED 3208	2	M LT 4306, Keyboard Lit.	3
American History	3	American History	3
M LT 4305, Keyboard Lit.	3	Elective	3
M EN 3106-1, Accompanying	1	M EN 3106-1, Accompanying	1
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
	17		18

FOURTH YEAR

Fall		*Spring*	
M AP 4001, Piano	4	M AP 4002, Piano	4
M AP 4303, Piano Pedagogy	3	Elective	3
Mus. Th. or Mus. Lit. elective	2-3	M TH 4307, Tonal Cpt. & Fugue	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
M EN 3106-1, Accompanying	1	M EN 3106-1, Accompanying	1
	13-14		14

*Program shown is for performance majors. Pedagogy or accompanying specialization students should consult the chairperson of keyboard studies.
**SCOM 1301 or PHIL 2310 may be substituted.

Performance — Organ Curriculum.

FIRST YEAR

Fall		*Spring*	
M AP 1001, Organ	4	M AP 1002, Organ	4
M AP 1001, Piano	1	M AP 1002, Piano	1
M LT 1301, Intro. Music Lit.	3	M LT 1302, Intro. Music Lit.	3
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
Ensemble	1	Ensemble	1
P.E., Band, or ROTC	1	P. E., Band, or ROTC	1
	18		18

SECOND YEAR

Fall		*Spring*	
M AP 2001, Organ	4	M AP 2002, Organ	4
M TH 2403, Intermed. Theory	4	M TH 2404, Intermed. Theory	4
ENGL 2301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.*	3
M LT 2301, Hist. of Music	3	M LT 2302, Hist. of Music	3
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
Ensemble	1	Ensemble	1
	16		16

THIRD YEAR

Fall		*Spring*	
M AP 3001, Organ	4	M AP 3002, Organ	4
M AP 3203, Church Serv. Playing	2	Mus. Theory or Mus. Lit. elective	3
M TH 3303, Form, Anal. & Synth.	3	M ED 3208, Instrumental Cond.	2
M ED 3207, Choral Conducting	2	American History	3
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
American History	3	Elective	3
Elective	3	Ensemble	1
Ensemble	1		17
	19		

FOURTH YEAR

Fall		*Spring*	
M AP 4001, Organ	4	M AP 4002, Organ	4
M TH 4305, Counterpoint	3	Mus. Theory or Mus. Lit. elective	2
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
Music elective	3	Music elective	3
M EN 3106-1, Accompanying	1	M EN 3106-1, Accompanying	1
Ensemble	1	Ensemble	1
	15		14

*SCOM 1301 or PHIL 2310 may be substituted.

Performance – Voice Curriculum.

FIRST YEAR

Fall		*Spring*	
M AP 1001, Voice	2	M AP 1002, Voice	2
Applied Music (piano)	1	Applied Music (piano)	1
M LT 1301, Intro. Music Lit.	3	M LT 1302, Intro. Music Lit.	3
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
FREN 1305 or GERM 1305 or ITAL 1301, Pronun. & Diction	3	FREN 1305 or GERM 1305 or ITAL 1301, Pronun. & Diction	3
Ensemble	1-2	Ensemble	1-2
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
P.E.: Dance or Fencing	1	P.E.: Dance or Fencing	1
	18-20		18-20

SECOND YEAR

Fall		*Spring*	
M AP 2001, Voice	3	M AP 2002, Voice	3
M LT 2301, Hist. of Music	3	M LT 2302, Hist. of Music	3
M TH 2403, Intermed. Theory	4	M TH 2404, Intermed. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 2301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.*	3
Foreign Language	3-4	Foreign Language	3-4
Ensemble	1-2	Ensemble	1-2
	18-20		18-20

THIRD YEAR

Fall		*Spring*	
M AP 3001, Voice	4	M AP 3002, Voice	4
M AP 3303, Vocal Literature	3	TH A 2302, Prin. of Acting	3
M TH 3303, Form, Analysis, Syn.	3	MUS 2101, Music in Performance	1
MUS 2101, Music in Performance	1	American History	3
American History	3	Foreign Language	3
Foreign Language	3	Ensemble	2-4
Ensemble	1-3		16-18
	18-20		

FOURTH YEAR

Fall		*Spring*	
M AP 4001, Voice	4	M AP 4002, Voice	4
M ED 3207, Conducting	2	M AP 4305, Vocal Pedagogy	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Public Pol.	3
Elective**	6	Elective**	3
Ensemble	2-4	Ensemble	2-4
	17-19		15-17

*SCOM 1301 or PHIL 2310 may be substituted.
**Recommended electives are TH A 3302 and a third year of the same foreign language.

Performance – Wind Instrument or Percussion Curriculum.

FIRST YEAR

Fall		*Spring*	
M AP 1001, Major Instr.	4	M AP 1002, Major Instr.	4
Applied Music (piano)	1	Applied Music (piano)	1
M LT 1301, Intro. Mus. Lit.	3	M LT 1302, Intro. Mus. Lit.	3
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
*Ensemble	1-2	*Ensemble	1-2
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	18-19		18-19

SECOND YEAR

Fall		*Spring*	
M AP 2001, Major Instr.	4	M AP 2002, Major Instr.	4
Applied Music (piano)	1	Applied Music (piano)	1
M LT 2301, Hist. of Music	3	M LT 2302, Hist. of Music	3
M TH 2403, Intermed. Theory	4	M TH 2404, Intermed. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 2301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.**	3
*Ensemble	1-2	*Ensemble	1-2
	17-18		17-18

THIRD YEAR

Fall		*Spring*	
M AP 3001, Major Instr.	4	M AP 3002, Major Instr.	4
M TH 3303, Form, Anal. & Syn.	3	Mus. Theory or Mus. Lit. elective	3
M ED 3208, Instr. Cond.	2	MUS 2101, Music in Performance	1
MUS 2101, Music in Performance	1	American History	3
American History	3	Elective	3
Elective	3	*Ensemble	1-2
*Ensemble	1-2		15-16
	17-18		

FOURTH YEAR

Fall		*Spring*	
M AP 4001, Major Instr.	4	M AP 4002, Major Instr.	4
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
M TH 4305, Modal Counterpoint	3	Elective	6
M TH 4207, Instrumentation	2	*Ensemble	1-2
Elective	3		14-15
*Ensemble	1-2		
	16-17		

*Twelve registrations in Ensemble required.
**SCOM 1301 or PHIL 2310 may be substituted.

Performance – Stringed Instrument Curriculum.

FIRST YEAR

Fall		*Spring*	
M AP 1001, Major Instr.	4	M AP 1002, Major Instr.	4
Applied Music (piano)	1	Applied Music (piano)	1
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
M LT 1301, Intro. Mus. Lit.	3	M LT 1302, Intro. Mus. Lit.	3
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
***M EN 3104 or 3204, Orch.	1	M EN 3104 or 3204, Orch.	1
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	18		18

SECOND YEAR

Fall		*Spring*	
M AP 2001, Major Instr.	4	M AP 2002, Major Instr.	4
Applied Music (piano)	1	Applied Music (piano)	1
M TH 2403, Intermed. Theory	4	M TH 2404, Intermed. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.**	3
M LT 2301, Hist. of Music	3	M LT 2302, Hist. of Music	3
M EN 3104 or 3204, Orch.	1-2	M EN 3104 or 3204, Orch.	1-2
M EN 3106-2, Chamber Music	1	M EN 3106-2, Chamber Music	1
*Elective	2		
	20-21		18-19

THIRD YEAR

Fall		*Spring*	
M AP 3001, Major Instrument	4	M AP 3002, Major Instr.	4
M TH 3303, Form, Anal. & Syn.	3	Mus. Theory or Mus. Lit. elective	3
M ED 3208, Instr. Conducting	2	MUS 2101, Music in Performance	1
MUS 2101, Music in Performance	1	American History	3
American History	3	Elective	3
Elective	3	M EN 3104 or 3204, Orch.	1-2
M EN 3104 or 3204, Orch.	1-2	M EN 3106-2, Chamber Music	1
M EN 3106-2, Chamber Music	1		
	18-19		16-17

FOURTH YEAR

Fall		*Spring*	
M AP 4001, Major Instr.	4	M AP 4002, Major Instr.	4
M TH 4305, Modal Counterpoint	3	M TH 4207, Instrumentation	2
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
Elective	3	Elective	3
M EN 3104 or 3204, Orch.	1-2	M EN 3104 or 3204, Orch.	1-2
M EN 3106-2, Chamber Music	1	M EN 3106-2, Chamber Music	1
	15-16		14-15

*Violin students must elect M AP 2001 (viola); viola students must elect M AP 2001 (violin). (Does not apply to guitar students.)

**SCOM 1301 or PHIL 2310 may be substituted.

***Guitar students participate in guitar ensemble for six semesters and guitar chamber music for six semesters, and in a large ensemble for two semesters.

Music Composition Curriculum.

FIRST YEAR

Fall		*Spring*	
M AP 1001, Prin. Instr. or Voice	2	M AP 1002, Prin. Instr. or Voice	2
Applied Music, Sec. Instr.*	1	Applied Music, Sec. Instr.*	1
M CP 1201, Mus. Composition	2	M CP 1202, Mus. Composition	2
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
M LT 1301, Intro. Mus. Lit.	3	M LT 1302, Intro. Mus. Lit.	3
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
Ensemble	1	Ensemble	1
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	18		18

SECOND YEAR

Fall		*Spring*	
M AP 2001, Prin. Instr. or Voice	2	M AP 2002, Prin. Instr. or Voice	2
Applied Music, Sec. Instr.*	1	Applied Music, Sec. Instr.*	1
M CP 2401, Mus. Composition	4	M CP 2402, Mus. Composition	4
M TH 2403, Inter. Theory	4	M TH 2404, Inter. Theory	4
M LT 2301, Hist. of Music	3	M LT 2302, Hist. of Music	3
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 2301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.**	3
Ensemble	1	Ensemble	1
	19		19

THIRD YEAR

Fall		*Spring*	
M AP 3001, Prin. Instr. or Voice	2	M AP 3002, Prin. Instr. or Voice	2
M CP 3401, Mus. Composition	4	M CP 3402, Mus. Composition	4
M TH 3303, Form, Analysis, Syn.	3	M TH 3304, Form, Analysis, Syn.	3
M TH 4207, Instrumentation	2	M TH 4208, Orchestration	2
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
American History	3	American History	3
Ensemble	1	Ensemble	1
	16		16

FOURTH YEAR

Fall		*Spring*	
M CP 4401, Mus. Composition	4	M CP 4402, Mus. Composition***	4
M TH 4305, Modal Counterpoint	3	M TH 4307, Tonal Cpt. & Fugue	3
M ED 3207, Choral Meth. & Techs. or 3208	2	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3	Elective	3
Elective	3	Ensemble	1
Ensemble	1		14
	16		

*Choice of secondary instrument depends on student's principal instrument. All students must pass the piano grade level IV examination and grade level V if piano is the principal instrument. One semester of study of each of three orchestral instruments (strings, woodwinds, and brass) is also required.

**SCOM 1301 or PHIL 2310 may be substituted.

***Candidates for the Bachelor of Music degree with a major in music composition are required to present a recital of their original compositions during the senior year. Permission to present the recital must be obtained from the composition faculty one semester prior to the recital.

Music History and Literature Curriculum.

FIRST YEAR

Fall		*Spring*	
M AP 1001, Prin. Instr.	2	M AP 1002, Prin. Instr.	2
*Applied Music, Sec. Instr.	1	*Applied Music, Sec. Instr.	1
M LT 1301, Intro Mus. Lit.	3	M LT 1302, Intro. Mus. Lit.	3
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
American History	3	American History	3
Ensemble or Coll. Musicum	1-2	Ensemble or Coll. Musicum	1-2
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	19-20		19-20

SECOND YEAR

Fall		*Spring*	
M AP 2001, Prin. Instr.	2	M AP 2002, Prin. Instr.	2
*Applied Music, Sec. Instr.	1	*Applied Music, Sec. Instr.	1
M LT 2301, Hist. of Mus.	3	M LT 2302, Hist. of Mus.	3
M TH 2403, Intermed. Theory	4	M TH 2404, Intermed. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 2301, Mast. of Lit.	3	**ENGL 2302, Mast. of Lit.	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
Ensemble or Coll. Musicum	1-2	Ensemble	1-2
	18-19		18-19

THIRD YEAR

Fall		*Spring*	
M AP 3001, Prin. Instr.	2	M AP 3002, Prin. Instr.	2
†Music Literature	3	M TH 3304, Form, Anal. & Syn.	3
M TH 3303, Form, Anal. & Syn.	3	MUS 2101, Music in Performance	1
MUS 2101, Music in Performance	1	Foreign Language	4
Foreign Language (German or French recommended)	4	Elective	3
Ensemble	1-2	Ensemble	1-2
Elective	3		14-15
	17-18		

FOURTH YEAR

Fall		*Spring*	
M AP 4001, Prin. Instr.	2	M AP 4002, Prin. Instr.	2
†Music Literature	3	†Music Literature	3
Foreign Language	3	Foreign Language	3
Ensemble or Coll. Musicum	1-2	Ensemble	1-2
M LT 4315, Mus. Rom. Pd.	3	M LT 4316, Mus. Twen. Cen.	3
Elective	3	Elective	3
	15-16		15-16

*Secondary instrument will be piano if principal is not. If piano is the principal, the student will take M AP 1105, 1106, 2105, 2106 instead of a secondary instrument.
**SCOM 1301 or PHIL 2310 may be substituted.
†Select from M LT 4312, 4313, 4314, 4315, or 4316.

Music Theory Curriculum.

FIRST YEAR

Fall		*Spring*	
M AP 1001, Prin. Instr.	2	M AP 1002, Prin. Instr.	2
*Applied Music, Sec. Instr.	1	*Applied Music, Sec. Instr.	1
M LT 1301, Intro. Mus. Lit.	3	M LT 1302, Intro. Mus. Lit.	3
M TH 1403, El. Theory	4	M TH 1404, El. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
Foreign Lang. (Fr., Germ., Ital.)	4	Foreign Lang. (Fr., Germ., Ital.)	4
Ensemble	1	Ensemble	1
P.E., Band, or ROTC	1	P.E., Band, or ROTC	1
	20		20

SECOND YEAR

Fall		*Spring*	
M AP 2001, Prin. Instr.	2	M AP 2002, Prin. Instr.	2
*Applied Music, Sec. Instr.	1	*Applied Music, Sec. Instr.	1
M TH 2403, Intermed. Theory	4	M TH 2404, Intermed. Theory	4
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
ENGL 2301, Mast. of Lit.	3	**ENGL 2302, Mast. of Lit.	3
Foreign Lang. (Fr., Germ., Ital.)	3	Foreign Lang. (Fr., Germ., Ital.)	3
M LT 2301, Hist. of Music	3	M LT 2302, Hist. of Music	3
Ensemble	1	Ensemble	1
	18		18

THIRD YEAR

Fall		*Spring*	
M AP 3001, Prin. Instr.	2	M AP 3002, Prin. Instr.	2
M TH 3303, Form, Anal. & Syn.	3	M TH 3304, Form, Anal. & Syn.	3
M ED 3207, Choral Cond.	2	M ED 3208, Instr. Cond.	2
M TH 4305, Modal Counterpoint	3	M TH 4307, Tonal Cpt. & Fugue	3
MUS 2101, Music in Performance	1	MUS 2101, Music in Performance	1
American History	3	American History	3
Ensemble	1	Ensemble	1
Music elective	2-3	Music elective	2-3
	17-18		17-18

FOURTH YEAR

Fall		*Spring*	
M AP 4001, Prin. Instr.	2	M AP 4002, Prin. Instr.	2
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
Elective	3	Elective	3
M TH 4207, Instr.	2	M TH 4208, Orchestration	2
M TH 4302, Fund. of Comp.	3	M TH 4303, Fund. of Comp.	3
Music Lit. elective	3	Music Lit. elective	3
Ensemble	1	Ensemble	1
	17		17

*Choice of secondary instrument depends upon the student's principal instrument. All students must pass the piano grade level IV examination, and grade level V if piano is the principal instrument. One semester of study on each of three orchestral instruments (strings, woodwinds, brass) is also required.
**SCOM 1310 or PHIL 2310 may be substituted.

Music Education Curricula.

Secondary — Instrumental Specialization	*Secondary — Vocal Specialization*
MUSIC CORE	
Principal Instrument: M AP 1001, 1002, 2001, 2002, 3001, 3002, 2 hrs. each	Voice: M AP 1001, 1002, 2001, 2002, 3001, 3002, 2 hrs. each
Piano: Must pass proficiency level equivalent to M AP 2124 if not a piano principal	Piano: M AP 1123 or 1101, 1124 or 1102, 2123 or 2101, 2124 or 2102 (Must pass proficiency level equivalent to M AP 2124 if not a piano principal)
Minor Instruments: M AP 1103, 1104, 2103, 2104, 3103, 3104, 4103, 4104	Minor Instruments: M AP 1103, 2103, 3103, 4103
Music Literature: M LT 1301, 1302, 2301, 2302	Music Literature: M LT 1301, 1302, 2301, 2302
Music Theory: M TH 1403, 1404, 2403, 2404, 3303, 4207, or 4208	Music Theory: M TH 1403, 1404, 2403, 2404, 3303
Major Ensemble: 8 hrs.	Major Ensemble: 8 hrs.
Music in Performance: MUS 2101, 6 sem.	Music in Performance: MUS 2101, 6 sem.
67-71 hrs.	65 hrs.

MAJOR COURSES	
M ED 3207, 3208, 3225, 3226 2 hrs. from M ED 3224, 3228, 3229	M ED 3207, 3208, 3228, 3229 2 hrs. from M ED 3225, 3226
10 hrs.	10 hrs.
GENERAL REQUIREMENTS	
English: 12 hrs. Math.: 2 sem. or lab. science: 2 sem. Foreign language: 2 sem. American History: 6 hrs. POLS 2301, 2302 P.E., Band, or ROTC: 2 sem.	English: 12 hrs. Math.: 2 sem. or lab. science: 2 sem. Foreign language: 2 sem. American History: 6 hrs. POLS 2301, 2302 P.E., Band, or ROTC: 2 sem.
38-42 hrs.	38-42 hrs.
EDUCATION COURSES	
EDSE 3300 EPSY 3330 EDSE 3321 EDSE 4320 EDSE 4692	EDSE 3300 EPSY 3330 EDSE 3321 EDSE 4320 EDSE 4692
18 hrs.	18 hrs.
ELECTIVES	
Academic electives: 6 hrs. Music Theory or Literature: 3 hrs.	Academic electives: 6 hrs. Music Theory or Literature: 5 hrs.
9 hrs.	11 hrs.
Minimum Total — 142-150 hrs.	Minimum Total — 142-146 hrs.

Music Education Curricula.

All-Level — General Specialization

MUSIC CORE

Principal Instrument: M AP 1001, 1002, 2001, 2002, 3001, 3002, 2 hrs. each
Piano: Must pass proficiency level equivalent to M AP 2124 if not a piano principal
Minor Instruments: M AP 1113, 1114 (if not voice principal), 2133
Music Literature: M LT 1301, 1302, 2301, 2302
Music Theory: M TH 1403, 1404, 2403, 2404, 3303, 4207
Music Ensemble: 8 semesters
Music in Performance: MUS 2101, 6 semesters

62 hrs.

MAJOR COURSES

M ED 3207 or 3208, 3228, 3229, 3337, 4337 plus one of the following: M ED 3225, 3226, 4221

14 hrs.

All-Level — Elementary Specialization	*All-Level — Instrumental Specialization*
MUSIC CORE	
Principal Instrument: M AP 1001, 1002, 2001, 2002, 3001, 3002, 2 hrs. each Piano: Must pass proficiency level equivalent to M AP 2124 if not a piano principal Minor Instruments: M AP 1113, 1114 (if not voice principal) Music Literature: M LT 1301, 1302, 2301, 2302 Music Theory: M TH 1403, 1404, 2403, 2404, 3303, 4207 Music Ensemble: 8 hrs. Music in Performance: MUS 2101, 6 sem.	Principal Instrument: M AP 1001, 1002, 2001, 2002, 3001, 3002, 2 hrs. each Piano: Must pass proficiency level equivalent to M AP 2124 if not a piano principal Minor Instruments: M AP 1103, 2103, 3103, 4103 Music Literature: M LT 1301, 1302, 2301, 2302 Music Theory: M TH 1403, 1404, 2403, 2404, 3303, 4207 Music Ensemble: 8 hrs. Music in Performance: MUS 2101, 6 sem.
61 hrs.	63 hrs.
MAJOR COURSES	
M ED 3207, 3228, 3229, 3337, 4221, 4337	M ED 3208, 3225, 3226, 3228 or 3229, 3337, 4337
14 hrs.	14 hrs.
All Specializations	
GENERAL REQUIREMENTS	
English: 12 hrs. Math.: 2 sem. or lab. science: 2 sem. Foreign language: 2 sem. American History: 6 hrs. POLS 2301, 2302 P.E., Band, or ROTC: 2 sem.	
38-42 hrs.	
EDUCATION COURSES	
EPSY 3330 EDCI 3386, ECEL 3320, 4391, EDSE 3321, 4392	
18 hrs.	
ELECTIVES	
Academic electives: 6 hrs. Music Theory or Literature: 3 hrs.	
9 hrs.	

Minimum Total — 140-146 hrs.

Courses in Music. (MUS)

2101. Music in Performance (1:0:2). Solo and ensemble performance participation and evaluation. A study of the performer's art. May be repeated for credit for a maximum of six credits.

4301. Individual Studies in Music (3).

Courses in Applied Music. (M AP)

Applied music instruction is offered in Baritone, Bassoon, Carillon, Clarinet, Cornet or Trumpet, Double Bass, Flute, French Horn, Guitar, Harp, Harpsichord, Oboe, Organ, Percussion, Piano, Saxophone, Trombone, Tuba, Viola, Violin, Violoncello, and Voice.

1103, 1104. Percussion (1 each). Beginning and intermediate experience on the snare drum; introduction to all other percussion instruments, with emphasis on teaching techniques.

1105, 1106, 2105, 2106. Keyboard Skills (1 each). Sight reading and ensemble skills. Required of all piano majors for 4 semesters.

1113, 1114. Voice (1 each). Correct posture and studies for breath control; development of resonance; study of vowel formation; vocalization. Simple songs. Laboratory ensemble experience.

1123, 1124. Piano (1 each). Sight reading, melodic transposition, and harmonization. Laboratory ensemble experience.

1223, 1224. Semiautomatic Keyboard (2:0:3 each). *For nonmusic majors.* Beginning and intermediate class instruction in semiautomatic keyboard instruments.

2103, 2104. Strings (1 each). Ability to play scales on violin, viola, cello, and bass. Laboratory ensemble experience.

2123, 2124. Piano (1 each). Sight reading, major and minor scales, repertoire suited to individual majors. Laboratory ensemble experience.

2133, 2134. Class Guitar (1 each). *For nonmusic majors.* Beginning and intermediate instruction in guitar; basic left and right hand approaches of classical technique; basic chords and accompaniment styles.

3103, 3104. Brass Instruments (1 each). Fundamentals of playing and teaching brass instruments. Laboratory ensemble experience.

3203. Church Service Playing (2). Prerequisite: M AP 2002 (Organ) or equivalent. Literature, modulation, improvisation, hymn playing, and transcription for church services. Individual study course.

3303. Vocal Literature (3). Prerequisite: M LT 2301, 2302. Historical and analytical survey of vocal solo literature from the Baroque period to the present with emphasis on the 19th century art song.

4103, 4104. Woodwinds (1 each). Fundamentals of playing and teaching woodwinds. Laboratory ensemble experience.

4303, 4304. Piano Pedagogy (3 each). Teaching procedures for prospective piano teachers, including rudiments, techniques, and materials.

4305. Vocal Pedagogy (3). Prerequisite: M AP 2002 (voice). Teaching procedures for prospective voice teachers, including exercises, styles, and student teaching.

Applied Music, 1001, 1002, 2001, 2002, 3001, 3002, 4001, 4002. Instrument or Voice (1 each).

Applied Music, 1001, 1002, 2001, 2002, 3001, 3002, 4001, 4002. (2 to 4 each).

Courses in Music Composition. (M CP)

1201, 1202. Music Composition (2 each). *Open to all students.* Semesters I and II. Free composition in the smaller forms for piano, voice, solo instrument, or electronic media. May be an individual study course.

2401, 2402. Music Composition (4 each). Prerequisite: M CP 1202 or the equivalent. For music composition majors. Semesters I and II. Work in the larger and classic forms; calligraphy of music, layout and notation; reproduction and copyright procedures; electronic music media. May be an individual study course.

3401, 3402. Music Composition (4 each). Prerequisite: M CP 2402 or the equivalent. For music composition majors. Semesters I and II. Work in the large forms for solo instruments and chamber ensembles with or without electronic media. May be an individual study course.

4401, 4402. Music Composition (4 each). Prerequisite: M CP 3402 or the equivalent. For music composition majors. Semesters I and II. Free composition for large ensembles with or without electronic media, orchestra, band, choir, or music theater and preparation of Recital of Original Compositions. May be an individual study course.

Courses in Music Education. (M ED)

2301. Music for Classroom Teachers (3:3:0). Prerequisite: Sophomore standing. *For elementary education majors.* Rudiments of music using a vocal and keyboard approach. Elementary music reading.

2302. Elementary Music Principles, Practices, and Materials (3:3:0). Prerequisite: M ED 2301 or equivalent. *For elementary education majors.* Emphasis on music activities for elementary school children.

2303. Music and the Special Learner (3:3:0). Prerequisite: Sophomore standing. Specialized teaching techniques, materials, and musical experiences to assist the elementary teacher in developing skills necessary for handling classes which include students with learning disabilities.

3207. Choral Methods and Techniques (2:2:0). Prerequisite: 4 semesters of voice. Fundamental techniques of choral conducting. Rehearsal techniques. (Offered fall only.)

3208. Instrumental Conducting (2:2:0). Prerequisite: M TH 2404 or equivalent. Baton techniques, score reading, and interpretation. (Offered spring only.)

3221, 3222. Music Literature for Elementary Teachers (2:2:0 each). Prerequisite: M ED 3330. For elementary education majors specializing in music. The teaching of listening in the elementary school with particular emphasis upon styles and form through appropriate masterworks.

3224. Jazz Ensemble Methods and Techniques (2:2:0). Prerequisite: M TH 2404 or junior standing. The organization, development, and administration of junior and senior high school jazz ensembles. (Offered alternate spring semesters in rotation with M LT 3305.)

3225, 3226. Instrumental Techniques for Junior and Senior High School (2:2:0 each). Repertoire organization and administration of school instrumental groups; Semester I, orchestra and marching band; Semester II, wind and percussion ensembles.

3228. Vocal Techniques for Senior High School (2:2:0). Teaching procedures and vocal music materials for senior high school.

3229. Music in the Junior High School (2:2:1). Teaching procedures and vocal music materials for junior high school. Field experiences arranged. (Offered fall only.)

3330. Theory for Elementary Teachers (3:3:0). Prerequisite: M ED 2301. For elementary education majors specializing in music. The study of harmonic and melodic concepts through creative activities.

3336. Music for Young Children (3:3:0). Music as an enhancement to the intellectual, emotional, and social growth of young children (ages 3-8).

3337. Elementary School Teaching and Supervision of Music (3:3:0). Prerequisite: Junior standing. For music majors and specialists. Procedures in teaching music in the first six grades; selection and presentation of materials.

4221. Children's Literature in Music (2:2:0). Prerequisite: Junior standing. A study in depth of the present-day materials involving the listening program in the elementary schools. Methods for presenting the elements of music to young children are explored.

4307. Choral Conducting (3). Prerequisite: M ED 3207 or equivalent. Study and performances of representative choral works of all periods. Participation in a major choral organization required. An individual study course.

4308. Instrumental Conducting (3). Prerequisite: M ED 3208 or equivalent. Study and performance of instrumental works of all periods. Participation in a major instrumental ensemble required. An individual study course.

4337. Developing Creative Musical Programs in the Elementary Schools (3:3:0). Prerequisite: Junior standing; enrollment in or completion of M ED 3337. Study of the creative process in music. Exploring the roles of composer, performer, listener, and critic as experienced by elementary school children.

Courses in Music Ensemble. (M EN)

Each ensemble may be taken for four successive years, since the literature studied will cover a cycle of that period of time. Two semester hours of M EN 1103 may be substituted for required physical education. Ensembles include Band, Choir, Music Theatre, Orchestra, Brass Band, Chamber Orchestra, Jazz Ensemble, Jazz Combo, Chamber Music, Brass Choir, Woodwind Ensemble, Guitar Ensemble, Viola Ensemble, Flute Ensemble, Saxophone Ensemble, Oboe Ensemble, Clarinet Ensemble, Trumpet Ensemble, French Horn Ensemble, Trombone Ensemble, Tuba Ensemble, Percussion Ensemble, Harp Ensemble, New Music Ensemble, and Piano Accompanying.

1103. Marching Band (1:0:5).
3101. Choir (1:0:3).
3102. Music Theatre (1:0:3).
3103. Band (1:0:3).
3104. Orchestra (1:0:5).
3105. Jazz Ensemble (1:0:3).
3106. Instrumental Ensemble (1:0:3).
3201. Tech Choir (2:0:5).
3202. Music Theatre (2:0:5).
3203. Band (2:0:5).
3204. Orchestra (2:0:5).

Courses in Music Literature. (M LT)

1301, 1302. Introduction to Music Literature (3:3:0 each). Through directed listening, music of various forms and styles is considered. Introduction to music history showing relationship of music studied to that preceding and following it.

1308. Music Appreciation (3:3:0). Beginning course for nonmajors. Appreciation of music is encouraged through consideration of a variety of musical styles. *Satisfies fine arts/humanities degree requirement.*

2301, 2302. History of Music (3:3:0 each). Prerequisite: M LT 1301, 1302. Historical survey of the music of Western civilization from ancient times to the present.

2308, 2309. Heritage of Music (3:3:0 each). *For nonmusic majors.* Selected compositions will be studied through an interpretation of their historical, functional, and cultural significance. *Satisfies fine arts or humanities degree requirement.*

3304. History of Jazz (3:3:0). *For nonmusic majors.* Historical and analytical survey of jazz from its beginning through "Rock" — its form, style, literature, and influence on 20th century music. *Satisfies fine arts or humanities degree requirement.*

3305. Jazz Styles, History and Literature (3:3:0). Prerequisite: M TH 2404 or junior standing. For music majors. A detailed study of jazz from its beginning to the present using scores, recordings, and musical examples. (This course may count toward the upper level music literature or theory requirements for wind and percussion majors only. For other music majors, the course is an elective.) (Offered alternate spring semesters in rotation with M ED 3224.)

3308. Masterpieces in Music (3:3:0). *For nonmusic majors.* Representative musical works from the Baroque Period to the present are studied in relation to their historical and general cultural context. *Satisfies fine arts or humanities degree requirement.*

4305, 4306. Keyboard Literature I, II (3:3:0 each). A survey of keyboard literature from earliest times to the present. Class performance and listening.

4312. Music of the Renaissance Period (3:3:0). Prerequisite: M LT 1301, 1302 and 2301, 2302. A survey of music from c.1450 to c.1600.

4313. Music of the Baroque Period (3:3:0). Prerequisite: M LT 1301, 1302 and 2301, 2302. A survey of history and literature of music from c.1600 to c.1750.

4314. Music of the Classic Period (3:3:0). Prerequisite: M LT 1301, 1302 and 2301, 2302. Music of Haydn, Mozart, Beethoven, and their contemporaries.

4315. Music of the Romantic Period (3:3:0). Prerequisite: M LT 1301, 1302 and 2301, 2302. A survey of music from c.1825 to c.1900.

4316. Music of the Twentieth Century (3:3:0). Prerequisite: M LT 1301, 1302 and 2301, 2302. A study of trends and developments in music since 1900.

Courses in Music Theory. (M TH)

1301. Introduction to Music Theory (3:3:0). Emphasis on simple melody, rhythm, harmony, singing, and keyboard studies. *Nonmajor section available.*

1403, 1404. Elementary Theory (4:3:2 each). Melody, intervals, four-voice chords and nonharmonic material in major and minor tonalities; modulation; keyboard; sight-singing; melodic and harmonic dictation.

2403, 2404. Intermediate Theory (4:3:2 each). Prerequisite: M TH 1404 or equivalent. Analysis, written work, keyboard and dictation in four-voice texture including diatonic and altered triads, sevenths, augmented sixths; small contrapuntal forms; sight-singing.

3301. Arranging (3:3:0). Techniques of band arranging; jazz idioms; arranging for small combo and stage band; laboratory performances of student arrangements.

3303, 3304. Form, Analysis, and Synthesis (3:3:0 each). Prerequisite: M TH 2404 or equivalent. Homophonic and larger forms; analysis and synthesis of Classical, Romantic, Impressionist and Contemporary styles; harmonic and nonharmonic elements; analysis-performance reports.

4207. Instrumentation (2:2:0). Prerequisite: M TH 2404 or equivalent. Properties of woodwind, brass, string, and percussion instruments; transpositions techniques and mechanics of scoring within sections leading to full orchestral and band scoring.

4208. Orchestration (2). Prerequisite: M TH 4207. More advanced work in scoring for orchestra and band.

4302, 4303. Fundamentals of Composition (3 each). Prerequisite: Senior standing. Original writing in small forms for voice, solo instruments, and small ensembles; development of individual style. Select student works may be performed during the annual Festival of Contemporary Music. May be repeated for credit. Individual study course.

4305. Modal Counterpoint (3). Prerequisite: M TH 2404 or equivalent. Vocal counterpoint of sixteenth century; mass, motet, madrigal; solo vocal writing in the modes; synthesis in two-to-six-voice textures; group sight-reading of the literature.

4307. Tonal Counterpoint and Fugue (3). Prerequisite: M TH 2404 or the equivalent. Counterpoint of the eighteenth century including analysis of the literature and synthesis in two to four voice textures. Instrumental style is emphasized with particular attention to the techniques employed in the invention and fugal procedure.

Department of Philosophy

Associate Professor Daniel O. Nathan, Chairperson.
Charles Sanders Peirce Professor Ketner; Associate Professors Averill and Ransdell; Assistant Professors Berezdivin and Jobe; Adjunct Associate Professor Cortes; Visiting Assistant Professor Curzer.

This department supervises the following degree program: PHILOSOPHY, *Bachelor of Arts*. The department also participates in directing the minor in humanities and in the philosophical studies plan of the graduate program in interdisciplinary studies.

Education in philosophy develops abilities in critical thinking, increases understanding of normative issues, provides a unique interdisciplinary perspective on man in the universe, gives opportunities for critically examining methods of inquiry, yields a grasp of the development of human ideas in a cross-cultural perspective, while effectively increasing one's ability to understand others and to communicate with others. Philosophy majors may qualify for graduate work in philosophy in preparation for college or university teaching careers, but a major in philosophy is also recognized by many professional schools and employers as a fine preparation because persons with that background are able to think for themselves in a critical and objective manner.

Students majoring in philosophy must complete 30 hours in philosophy, including PHIL 2310. Minors are required to complete 18 hours in philosophy. Philosophy students must receive at least a C in any philosophy course in order for it to count toward major or minor requirements.

The department also participates in directing a program leading to double majors in philosophy and psychology, and in philosophy and English. It is possible to arrange double majors between philosophy and other departments as well.

Courses in Philosophy. (PHIL)

1310. Reasoning (3:3:0). Prerequisite: Freshman or sophomore standing. Basic methods of objective thinking. Considers elementary forms of reasoning, problem-solving techniques, and avoidance of common fallacies. Emphasis is upon developing skills in the practice of everyday logic.

2300. Beginning Philosophy (3:3:0). An introduction to philosophical thinkers, ideas, and methods.

2310. Logic (3:3:0). Development of formal methods for evaluating deductive reasoning. Additional topics may include uses of language, definition, nondeductive inference.

2320. Introduction to Ethics and Moral Issues (3:3:0). Discussion of problems and theories of morality. Includes the application of philosophical techniques to issues of contemporary moral concern.

3301. Classical Greek Philosophy (3:3:0). Study of the major philosophical ideas as originally developed in the western world by thinkers such as Socrates, Plato, Aristotle, and others.

3302. Asian Philosophy (3:3:0). Study of the major philosophical ideas originating in India and China, and developed generally in Asia.

3303. Modern European Philosophy (1600-1800) (3:3:0). Study of the major philosophical ideas as they developed in Great Britain and on the European continent since the Renaissance. Considers, among others, Descartes, Hume, and Kant.

3304. Existentialism and Phenomenology (3:3:0). Consideration of the meaning of human existence through study of thinkers such as Heidegger, Husserl, Levinas, Merleau-Ponty, Sartre, and others.

3305. American Philosophy (3:3:0). An examination of philosophical thought in the United States from prerevolutionary times to the present through the works of thinkers such as Edwards, Jefferson, Peirce, or Dewey.

3306. Analytic Philosophy (3:3:0). Currents of twentieth-century thought typified by the work of Moore, Russell, and Wittgenstein. Alternatively, exploration of a selected problem by means of methods characteristic of this tradition.

3320. Introduction to Political Philosophy (3:3:0). Basic issues and concepts in political philosophy, including discussion of such topics as justice, freedom, equality, authority, community, and the nature of politics and the state. (POLS 3331)

3321. Philosophy of Law (3:3:0). Discussion, based on study of philosophical writings, of various conceptions of law and their relation to morality. Includes philosophical problems about civil disobedience, justice, and criminal punishment.

3322. Biomedical Ethics (3:3:0). Discussion of conceptual and moral problems surrounding such issues as abortion, euthanasia, genetic research, behavior control, allocation of medical resources, health, and disease.

3324. Philosophy of Religion (3:3:0). Study of the nature of religious beliefs, experiences, and practices, and the relation of these to other major human concerns.

3330. Philosophy of Science (3:3:0). Inquiry into the nature of science, examination of basic scientific concepts, and the forms of scientific reasoning.

3331. Philosophy of Social and Human Sciences (3:3:0). Study of selected approaches, concepts, and methods in the social and human sciences, especially as these are related to the question of the nature of man and of human society.

4100. Philosophical Problems (1). Directed individual studies or conferences on selected advanced topics. May be repeated for credit.

4310. Advanced Logic (3:3:0). Prerequisite: PHIL 2310 or consent of instructor. Full treatment of sentential logic and first-order predicate logic. May also treat topics such as identity, definite descriptions, axiomatic systems, completeness.

4320. Ethics (3:3:0). Advanced topics in ethical theory, with special emphasis on the meaning and justification of moral judgments, the possibility of ethical knowledge, and the nature of moral standards.

4323. Aesthetics (3:3:0). Discussion of the nature of art and the principles of aesthetic judgment. Emphasis on philosophical problems arising in interpretation and evaluation of the arts.

4324. Philosophical Ideas in Literature (3:3:0). Prerequisite: Senior standing or consent of instructor. Philosophical ideas in British and American literature and in works in translation. (ENGL 4333)

4330. Epistemology (3:3:0). An examination of the nature and scope of knowledge, and the justification of various types of knowledge claims.

4331. Semiotic: Philosophy of Communication and Meaning (3:3:0). General theory of significance, meaning, and interpretation. Applications to areas such as communication, arts, sciences, or human relations.

4332. Philosophy of Mathematics (3:3:0). Prerequisite: Background in mathematics or consent of instructor. Inquiry into the nature of mathematics, exploration of the

nature of mathematical truth, and the existence of mathematical objects. Additional foundational issues may be included.

4340. Metaphysics (3:3:0). Consideration of the nature of what there is (ontology) or of the nature of the universe as a whole (cosmology).

Department of Physics

Professor Henry C. Thomas, Chairperson.

Professors Das Gupta, Kim, Lodhi, Mires, and Quade; Associate Professors Gott, Hatfield, Howe, Menzel, Myles, and Sandlin; Assistant Professors Agarwal, Boekema, and Lichti.

This department supervises the following degree programs: PHYSICS, *Bachelor of Arts, Bachelor of Science, Master of Science, Doctor of Philosophy.* The department also supervises programs in Applied Physics leading to the M. S. and the Ph. D. degrees. The program in engineering physics is listed under that heading of the College of Engineering.

The undergraduate curriculum in physics may lead to either a Bachelor of Arts or a Bachelor of Science degree. Students wishing to pursue these degrees should consult the departmental advisors.

A broad variety of minor subjects can be elected by a student majoring in physics. These include both such traditional choices as mathematics, chemistry, and geophysics and relatively nontraditional selections such as computer science, business, and electrical engineering. Students contemplating minors outside the College of Arts and Sciences should seek advice from the departmental advisors well before beginning that minor.

Physics majors will usually take the following sequence of courses in physics: PHYS 1105, 1106, 1308, 2301, 2302, 2402, 3104, 3301, 3305, 3306, 3308, 4302, 4304, 4305, 4307. The required mathematics courses for physics majors are MATH 1350, 1351, 1352, 2350, 3350, 3351, 4350, 4351. Students who intend to pursue graduate work in physics should give serious consideration to taking additional physics and mathematics courses, especially MATH 4356 and PHYS 4309.

In fulfilling degree requirements, majors in this department must have a grade average of 2.00 in physics courses, with at least 36 hours of physics in which a grade of C or better was received, and must meet the general requirements of the degree they are seeking, as described in this catalog.

Teacher Education. For those students seeking secondary certification to teach physics and other sciences, the following physics courses are required:

I. For students following Plan I (two teaching fields of 24 hours each): PHYS 1105, 1106, 1308, 2301, 2402, 3305, 4304; one course selected from PHYS 3103 or 3104; plus two courses selected from PHYS 3301, 3306, 3308, 3401, 4302, 4305, or 4309.

II. Science: Students may elect a broad field science option (Plan II). Work must be distributed in the science departments — biological sciences, chemistry, geosciences, and physics. Not more than 8 hours may be in geosciences. The student making this choice should consult the Chairperson of the Physics Department and should become familiar with the Teacher Education section of the catalog.

Courses in Physics. (PHYS)

1101. Experimental Elementary Physics I (Laboratory) (1:0:2). Prerequisite: PHYS 1303 or concurrent enrollment. Designed to introduce students to a variety of experimental techniques and to complement the lecture course PHYS 1303.

1102. Experimental Elementary Physics II (Laboratory) (1:0:2). Prerequisite: PHYS 1101 and 1303; PHYS 1304 or concurrent enrollment. A continuation of PHYS 1101.

1103. Experimental General Physics I (Laboratory) (1:0:2). Prerequisite: PHYS 1306 or concurrent enrollment. Designed to introduce students to a variety of laboratory techniques and to complement the lecture course PHYS 1306.

1104. Experimental General Physics II (Laboratory) (1:0:2). Prerequisite: PHYS 1103 and 1306; PHYS 1307 or concurrent enrollment. A continuation of PHYS 1103.

1105. Principles of Physics I (Laboratory) (1:0:2). Prerequisite: PHYS 1308 or concurrent enrollment. Designed to introduce students to a variety of experimental techniques and to complement the lecture course PHYS 1308.

1106. Principles of Physics II (Laboratory) (1:0:2). Prerequisite: PHYS 1105 and 1308; PHYS 2301 or concurrent enrollment. A continuation of PHYS 1105 that serves as a prerequisite for all advanced laboratory courses in physics.

1303, 1304. Physics for Nonscience Majors (3:3:0 each). Qualitative course intended to acquaint students with the basic laws and vocabulary of physics. A minimum of mathematics will be used. With laboratories PHYS 1101 and 1102, this course may be counted toward fulfillment of the natural science requirement in Arts and Sciences.

1305. Engineering Physics Analysis I (3:3:0). The profession of engineering physics and its relation to energy, materials, resources, computers, communication, and control. Basic computer programming. Synthesis and analysis of typical engineering physics problems. For engineering physics only.

1306, 1307. General Physics (3:3:0 each). Prerequisite: MATH 1320 and 1321. A noncalculus introductory physics course designed to provide students with a background for further study in science and related areas. Covers mechanics, heat, sound, electricity and magnetism, light, and modern physics. With laboratories PHYS 1103 and 1104, this course may be counted toward fulfillment of the natural science requirement in Arts and Science.

1308. Principles of Physics I (3:3:0). Corequisite: MATH 1351. Primarily a course in mechanics from Newton's Laws through relativity. Some wave motion.

1406. Physics of Sound and Music (4:3:3). A qualitative course designed to acquaint the student with the principles of physics used in the production of sound and music. A minimum of mathematics will be used.

2301. Principles of Physics II (3:3:0). Prerequisite: PHYS 1308, 1105; corequisite: MATH 1352. Electric and magnetic fields, dielectrics, magnetic properties of materials, electromagnetism, geometrical and physical optics.

2302. Introduction to Methods of Theoretical Physics (3:3:0). Prerequisite: PHYS 1308 and 2301. Introduces students to special mathematical functions used to solve problems in physics.

2402. Principles of Physics III (4:3:3). Prerequisite: PHYS 2301, 1106. Study of atomic and nuclear phenomena.

3103. Atomic and Nuclear Physics Laboratory (1:0:3). Prerequisite: PHYS 2402 or parallel enrollment in PHYS 3308; consent of instructor. Credit for either or both semesters.

3104. Intermediate Laboratory (1:0:3). Prerequisite: PHYS 1308, 2301, or equivalent and junior standing. Laboratory course in basic physical principles. May be repeated for credit.

3300. Undergraduate Research (3). Individual or group research project in either basic or applied physics, under the guidance of a member of the staff.

3301. Optics (3:2:3). Prerequisite: PHYS 1308, 2301. Major emphasis on physical optics.

3305, 3306. Electricity and Magnetism (3:3:0 each). Prerequisite: One year of physics and junior standing. Electrostatics, dielectric theory, Laplace's equation, transient and A.C. circuits, magnetic fields, vector potential, magnetic materials, and electromagnetic theory.

3307. Techniques of Photography (3:2:3). Fundamental processes and techniques of monochrome and color photography, for those who will need photography as a scientific or professional tool.

3308. Introduction to Nuclear Physics (3:3:0). Prerequisite: One year of physics and junior standing.

3401. Electronics (4:3:3). Prerequisite: PHYS 3305. General course in electronics stressing the fundamentals of electron behavior in areas of primary importance in the physical sciences.

4121. Engineering Physics Seminar (1:1:0). Prerequisite: Consent of department. Investigation and study of engineering problems of special interest and value to the student. May be repeated for credit. For engineering physics only.

4302. Statistical and Thermal Physics (3:3:0). Prerequisite: Differential equations or consent of department chairperson. Statistical formulation of thermodynamics and statistical mechanics with numerous applications from contemporary physics.

4304, 4305. Mechanics (3:3:0 each). Prerequisite: PHYS 1308, 2301, or equivalent, and differential equations. Statics, kinematics, and dynamics of rigid bodies, including Euler's equations, damped and forced vibrations, Lagrange's equations, Hamilton's equations, special relativity.

4306. Senior Project (3). Prerequisite: Senior standing in physics or engineering physics. Individual research project under the guidance of a member of the staff.

4307, 4308. Quantum Mechanics (3:3:0 each). Prerequisite: Differential equations. The Schrodinger equation, matrix representations, approximation methods, and scattering with applications in contemporary physics.

4309. Solid State Physics (3:3:0). Prerequisite: PHYS 3305 and differential equations or consent of department chairperson. Structural, thermal, electric, and magnetic properties of crystalline solids; free electron theory of metals; energy band theories; semiconductors.

Department of Political Science

Professor Clarke E. Cochran, Chairperson.

University Professor Kennedy; Professors Ershkowitz, Havens, Mayer, Oden, Pearson, Smith, Tamkoc, and Vengroff; Associate Professors Burnett, Hannon, Kyre, Perkins, and Schaefer; Assistant Professors Baber, Baldwin, Bartlett, Dometrius, Hughes, Nicholls, and Simowitz.

This department supervises the following degree programs: POLITICAL SCIENCE, *Bachelor of Arts, Master of Arts, Doctor of Philosophy;* and PUBLIC ADMINISTRATION, *Master of Public Administration*. The department also participates in the LATIN AMERICAN AREA STUDIES program leading to the *Bachelor of Arts* degree as well as in the urban studies, international studies, and ethnic studies minor programs and the Arts and Sciences honors program.

The political science curriculum is designed to provide students with a solid foundation and broad understanding of the discipline of political science, and to allow students to specialize in areas of particular substantive interest. Students seeking an undergraduate degree in political science must complete 30 hours of

course work within the department. Political science majors are required to take POLS 2301, preferably the section designated for majors. POLS 2302 may be skipped if the student receives an A or B in POLS 2301. Majors may, however, elect to take and count POLS 2302 as part of their program. All majors are required to take POLS 3310 which deals with quantitative and qualitative research methods. In addition, majors must take any three of the following (a, b, c, d): (a) POLS 3331; (b) POLS 3361; (c) POLS 3371; (d) POLS 4320 or 3341 or 3351.

The requirement for a minor in political science is 18 hours, including POLS 2301 and 2302. Minors may skip POLS 2302 if they receive an A or B in POLS 2301. Political science minors are also required to take any two of the above (a, b, c, d) choices.

The Department of Political Science coordinates a special multidisciplinary program at the graduate level for students interested in local, state, or federal government careers. The course work is interdepartmental in nature and includes courses tailored to meet the student's career objectives. An integral part of the program is placement as an intern in a unit of government.

Under state law, all students who receive bachelor's degrees from Texas Tech University must have received credit for 6 semester hours in political science, covering the federal and Texas constitutions. Students will normally fulfill this requirement by completing POLS 2301, which is a prerequisite for all other political science courses, and POLS 2302. If a student earns a grade of A or B in POLS 2301, he or she may substitute in place of POLS 2302 one of the upper level courses marked with an asterisk in the course list. Permission of the instructor may be required for such substitution.

Teacher Education. Students seeking certification to teach in the secondary or elementary schools of Texas may qualify for such certification in the course of completing requirements for either the Bachelor of Arts or the Bachelor of Science in Education degree.

The student of political science may qualify for teacher certification under a variety of plans. (1) Students desiring to teach in the secondary schools may offer political science as a teaching field. Such students must complete at least 24 hours in political science, including the general degree requirement in political science, 6 hours in advanced American Government, and 3 hours each from the fields of political theory, international relations, and comparative government. (2) Students preparing to teach in the elementary schools may offer political science as an area of academic specialization. There are two plans of academic specialization open to the prospective elementary school teacher. Should the student choose the 24-hour specialization plan, political science courses required are those in the political science teaching field above. If the student chooses the 18-hour specialization plan, the general degree requirement in political science and 3 hours each from the fields of American government, political theory, international relations, and comparative government must be completed. (3) Those students seeking secondary certification to teach in the broad field of social science must take the general degree requirement in political science. Political science courses may fulfill either the 24- or the 18-hour field requirements for this certificate. Courses required are those listed in the 24-hour and 18-hour plans above. For information on these plans, the student should consult the Director of Undergraduate Studies in Political Science.

Requirements and Prerequisites. POLS 2301 is a prerequisite for all other political science courses. Special sections of POLS 2301 are available for majors, minors, and others planning to take advanced courses in the social sciences. A student must receive at least a C in advanced courses in political science that apply to major, minor, or teaching field requirements.

Graduation with Distinction. Political science majors may graduate "with distinction in Political Science" by meeting the following requirements: 36 hours in political science, including POLS 4390 and 3 or 6 hours of POLS 4399; satisfactory completion of an individual project; and a 3.50 grade-point average (overall and in political science courses). Students with 18 hours of political science and 3.50 overall grade-point averages are invited to inquire about this program.

Courses in Political Science. (POLS)

2301. American Government, Organization (3:3:0). Constitutions and organization of the governments of the United States, the states in general, and Texas in particular. Special sections for prospective majors and minors are offered. (Honors section offered.)

2302. American Public Policy (3:3:0). Prerequisite: POLS 2301. The policy-making process in the governments of the United States, the states in general, and Texas in particular. Special sections emphasizing selected policy areas are offered. (Honors section offered.)

3310. Introduction to Political Analysis (3:3:0). Survey of methods of and approaches to the study of politics and their underlying assumptions as they apply to the major concepts of the discipline.

3331. Introduction to Political Philosophy (3:3:0). Basic issues and concepts in political philosophy, including discussion of such topics as justice, freedom, equality, authority, community, and the nature of politics and the state. (PHIL 3320)

***3341. The Administrative Process (3:3:0).** A survey of the field of public administration. Principles of administrative organization; distribution of administrative functions together with the structure of government charged with the carrying out of public policy.

***3351. The Judicial Process (3:3:0).** Analysis of the judicial process as part of the political process; judicial personnel and organization; sources and instruments of judicial power; judicial reasoning and behavior; and impact of judicial activity.

3361. International Politics (3:3:0). Theoretical and analytical study of international relations of states; elements and instruments of power; the struggle for power; propaganda, diplomacy, and limitations of power.

3371. Comparative Politics (3:3:0). The primary institutions (e.g., parties, groups, executives, legislatures) and processes (e.g., voting, instability) of politics as well as relevant social structures are viewed in various national settings. Questions of how and why to compare also are considered.

***4320. The Political Process (3:3:0).** Patterns of political activity linking citizens with the formulation of public policy, political communication, interest mobilization, and opinion articulation.

***4321. Local Government (3:3:0).** Cities, counties, and special districts are studied in terms of organization, recruitment, and services such as police, planning, and health; fiscal problems and their impact on citizens.

***4322. State Government (3:3:0).** The legal framework, institutional functions and powers, and political processes of American state government; the role of the states in the federal system; and problems and challenges confronting the states in the rapidly changing American society.

*4323. **Legislation (3:3:0).** Factors involved in the framing and enactment of statutory law with emphasis upon the work of the Congress of the United States.

*4324. **Government and the Economy (3:3:0).** The role played by various levels of government in the regulation of the economy, focusing attention on the demands placed upon the government and the conversion of demands into public policies.

*4325. **Political Parties (3:3:0).** Party history, functions, organization, finance, nominations, campaign methods, and elections.

*4327. **The American Presidency (3:3:0).** The presidency, its constitutional basis, structure, powers, functions, and responsibilities.

*4328. **Political Socialization and Alienation (3:3:0).** The process of political learning, the agents which shape this learning, and its effect on government and the political system.

*4329. **Ethnic Politics (3:3:0).** Political behavior and attitudes of ethnic groups, with emphasis on Black and Chicano politics.

4331. **Ancient and Medieval Political Theory (3:3:0).** Political ideas of the great thinkers in the Western world from the time of the Golden Age of Greece until the rise of modern political thought.

4332. **Modern Political Theory (3:3:0).** Major political thinkers starting with Machiavelli and Hobbes and movements such as liberalism, conservatism, utilitarianism, socialism, and communism.

4333. **Contemporary Political Theory (3:3:0).** Political thought since World War II; liberalism, conservatism, socialism, communism, and existentialism are examined and criticized. Attention is given to the roots of contemporary thought in the 19th century.

*4334. **American Political Theory (3:3:0).** Main currents in American political thought from colonial beginnings to the present day.

4337. **Religion and Politics (3:3:0).** Exploration of various aspects of the relationship between major world religions and politics, including questions of church and state.

4339. **Political Psychology (3:3:0).** Survey of the basic substantive hypotheses and theories using personality and dispositional sets as premises for political explanations and consideration of the methodological assumptions of the literature.

*4341. **Fiscal Administration (3:3:0).** Governmental budgeting and revenue raising, emphasizing theories, techniques, procedures, implementation, the political environment in which such activities take place, and possible alternatives to existing practices.

*4342. **Personnel Administration (3:3:0).** Fundamental concepts with analysis and evaluation of employee-employer relations at the national, state, and municipal levels. Treats topics such as environmental influences on the personnel function, career systems, manpower planning, organization of personnel offices, performance evaluation, ethics in public service, and collective bargaining.

*4344. **Urban Politics (3:3:0).** Governmental structures, politics, settings, and selected policy problems in urban areas of the United States.

*4345. **Administrative Organization and Management (3:3:0).** Organization from the perspectives of both traditional and modern theories of administration. Attention is devoted to traditional theory and the modifying influences of such factors as culture, status, power, and leadership.

*4346. **Public Policy Analysis (3:3:0).** The study of public policy formulation, implementation, and evaluation at various levels of government. Particular focus on health, social, and development policies. Attention to policy analysis skills and approaches used in government and consulting.

*4350. **Criminal Process (3:3:0).** An introduction to the law and government in action when man and state are in conflict. Areas examined include the nature and rationale of punishment, legislative problems in defining criminal behavior, and judicial problems in adjudicating within the legislative framework.

*4351. **Constitutional Law-Powers (3:3:0).** A case study of American constitutional law emphasizing constitutional bases of governmental power. Leading cases demonstrating the principles of separation of powers, judicial review, taxation, commerce, and implied powers.

*4352. **Constitutional Law-Limitations (3:3:0).** Primarily a case study of American constitutional law emphasizing the constitutional limitations on government, with particular emphasis on personal, civil, and political liberties.

*4353. **Administrative Law and Regulations (3:3:0).** The administrative process with particular emphasis on public law relating to the powers and procedures of administrative agencies having powers of adjudication and rule making.

4354. **Jurisprudence (3:3:0).** An investigation of the nature, operation, history, and analytical and philosophical approaches to private and public law in the modern state. Consideration of the responsibilities and interdependence of the judicial, legislative, and executive branches in the support of legal order.

*4361. **United States Foreign Policy (3:3:0).** A study of the major "tools" available to decision makers in the area of foreign policy; a survey of current American foreign policy and the leading critiques thereof.

4362. **Political Geography (3:3:0).** Political geography is an interdisciplinary subject. The emphasis is on the political aspects primarily; the ways in which geography restricts or enhances political policies and activities.

4363. **International Organization (3:3:0).** A comparative study of the major organizations of the League of Nations and the United Nations; approaches to peaceful settlement of disputes, collective security, disarmament, regional organizations, the future of world order.

4364. **International Law (3:3:0).** Relation between international law and national law; territory and territorial jurisdiction treaties; international claims and other international agreements and implications. Judicial decisions on the authority, operation, and possibilities of international law in the modern world.

*4365. **Problems in National Security (3:3:0).** The domestic and international role of the military in determination of strategy; structure of defense and quasi-military agencies; role of Congress and public opinion in decision making.

4367. **International Politics II (3:3:0).** Past and contemporary theories of international relations and the application of various techniques of analysis to major current issues.

4370. **Politics of the Developing Areas (3:3:0).** A broad introduction to the politics of Third World nations from the perspective of competing theories of development. Topics for consideration include the roles of revolution and violence, the military, ideology, parties, bureaucracies, and traditional leaders.

4372. **Government of the Union of Soviet Socialist Republics (3:3:0).** Marxist-Leninist theory; Communist Party apparatus; governmental bureaucracy; political culture and political socialization in the Soviet Union.

4373. **Governments of Western Europe (3:3:0).** Political culture, party systems, institutions, and behavior in selected countries of Western Europe. Primary attention paid to France, Germany, and Italy. Comparison between European and American political systems will be emphasized.

4374. **Governments of Mexico and the Caribbean (3:3:0).** Culture and constitutional development, ideologies, and functions of political parties and pressure groups in Mexico and selected countries of Central America and the Caribbean. Special attention will be given to problems of nationalism, revolution, and interaction with foreign powers and corporations.

4375. **South American Governments (3:3:0).** The government and politics of countries such as Argentina, Bolivia, Brazil, Chile, and Peru. Includes consideration of special problems such as land tenure and terrorism.

4377. **African Governments and Politics (3:3:0).** Political institutions and behavior in sub-Saharan Africa, with emphasis on theories of development and racism.

4378. Middle Eastern Governments and Politics (3:3:0). Major political institutions in the nations of the Middle East; the impact of Islam on the Ottoman Empire; nationalism, constitutionalism, parliaments, parties, and governments in Turkey, Egypt, Syria, Lebanon, Iraq, Jordan, Saudi Arabia, Iran, and Israel.

4379. British Government (3:3:0). Principles, policies, and politics of the government of Great Britain. Particular emphasis on political parties, governmental structure, and political behavior. Comparison with the United States and the Commonwealth. The impact of Britain on the development of democracy and parliamentary government.

4390. Senior Seminar (3:3:0). Seminar, normally team-taught, on major concepts or issues in political science, with topics varying from semester to semester. Open to students with 24 or more hours in political science.

4398. Selected Topics in Political Science (3:3:0). Special topics, varying from semester to semester. May be repeated for credit with changing subject matter.

4399. Individual Studies (3). Prerequisite: 15 hours of political science and consent of instructor. Independent research under the guidance of a staff member.

Department of Psychology

Professor John H. Harvey, Chairperson.

Professors Anderson, Bell, Elias, George, Halcomb, Locke, Mahone, Perez, Phillips, and Ray; Associate Professors Carlson, Chatfield, Clopton, D. Cogan, R. Cogan, Greene, Marshall, McGlynn, and Winer; Assistant Professors Chiodo, Iacono, Ingram, Maddux, and Stoltenberg; Visiting Associate Professors Trimble and Trzebrinski.

This department supervises the following degree programs: PSYCHOLOGY, *Bachelor of Arts, Master of Arts, Doctor of Philosophy.*

The advanced degrees encompass a number of different areas in clinical, counseling, and experimental psychology. The clinical and counseling doctoral fields are approved by the American Psychological Association. The department also provides courses which may apply toward a professional certificate in school counseling and guidance.

All undergraduate psychology majors must take at least 30 but not more than 42 hours in psychology. These courses must include the following core program: PSY 1300, 3317 and MATH 2300 or PSY 3403. Additionally, three courses must be taken from PSY 3304, 3306, 3327, 4301, 4316, 4323, and 4324.

Electives may be selected from any of the above courses not used to satisfy the core requirement or from any of the remaining 3000 or 4000 level courses offered by the department. PSY 1201 is also recommended as an elective.

As part of their electives, students who wish to apply to a graduate school in psychology after receiving their Bachelor of Arts degree are strongly advised to take several of the following courses: PSY 4307, 4336, and 4338.

Students intending to seek employment in psychology with a Bachelor of Arts degree or those interested in the delivery of human services are advised to take PSY 3334, 4305, 4321, 4328, 4333, and 4334. However, taking any of these courses is not inconsistent with plans to attend graduate school.

The department also participates in a program allowing for a double major in psychology and philosophy. Students in the program may apply 6 hours in approved philosophy courses toward psychology major electives.

An undergraduate minor in psychology consists of at least 18 hours in psychology including PSY 1300 and at least 9 hours of courses at the 3000 or 4000 level.

Psychology may be used as a teaching field for a secondary or primary teaching certificate, each requiring a minimum of 24 hours of course work. Psychology may also be used as an 18-hour field of specialization in a social science broad field (Plan II) program for primary or secondary certification. For a list of psychology courses approved for various teacher certification purposes students should check with a departmental advisor.

Grades below C in psychology courses will not be acceptable for fulfillment of major, minor, or teacher certification requirements.

Courses in Psychology. (PSY)

1201. Introduction to Research Methods (2:2:0). Prerequisite: PSY 1300 or concurrent enrollment in PSY 1300. A survey of research methods in psychology. Emphasis in techniques of experimental control.

1300. General Psychology (3:3:0). Introduction to fundamental concepts in psychology. Emphasis on genetic and environmental interactions, individual differences, personality dynamics, and group processes. (Honors section offered.)

2301. Child Psychology (3:3:0). Prerequisite: PSY 1300 or EPSY 3330 or F R 2320. A study of the developmental processes and environmental factors which shape the personality and affect the achievement of the child.

2302. Mental Health (3:3:0). Prerequisite: PSY 1300 or EPSY 3330 or F R 2320. A study of the individual and social factors which contribute to the development of both healthy and unhealthy personalities.

2305. Adolescent Psychology (3:3:0). Prerequisite: PSY 1300. A general review of approaches to the understanding of social behavior and development of adolescent. Physical, mental, and emotional growth and adjustment are covered.

3126. Individual Laboratory Problem (1:0:2). Prerequisite: Restricted to transfer students. This course is designed for those individuals who may be transferring only lecture credit for courses in which a laboratory experience is required. May be repeated for credit.

3300. Vocational Psychology (3:2:2). Prerequisite: PSY 1300 or consent of instructor. Theories, research, assessment, and intervention approaches in vocational psychology, including career development, decision making, and adjustments.

3304. Introduction to Social Psychology (3:3:0). Prerequisite: PSY 1300. Study of individual experience and behavior in relation to social stimulus situations. Survey of experimental work and reports on current problems.

3306. Personality (3:3:0). Prerequisite: PSY 1300. Principles of normal personality structure.

3317. The Psychology of Learning (3:2:2). Prerequisite: PSY 1300. A critical survey of methods, results, and interpretations of human and animal studies of learning processes. The laboratory paradigms will highlight principles discussed in lecture.

3327. Introduction to Physiological Psychology (3:3:0). Prerequisite: PSY 1300. Introduction to neuroanatomy, electrophysiological measuring techniques, and the mechanisms of receptor and effector systems. A study of the relationships between behavior and the physiological substrate.

3334. Introduction to Professional Psychology (3:3:0). Prerequisite: PSY 1300. Introduction to current practices of clinical and counseling psychologists including clinical diagnostic and intervention strategies. Survey of career opportunities, professional issues, and ethical problems.

3403. Statistical Methods (4:3:2). Prerequisite: PSY 1300 or EPSY 3330. Introduction to descriptive and inferential statistics through t-test and Chi-square. Emphasis is placed on statistical foundations in set and probability theory. Practice on calculators and introduction to computer functions.

4300. Psychology of Human Sexual Behavior (3:3:0). Study of human sexual behavior from a psychosocial viewpoint with emphasis on contemporary research methods and findings.

4301. Developmental Psychology (3:3:0). Prerequisite: 6 hours of psychology. An advanced study of the process of development through consideration of data, theories, and contemporary research issues.

4305. Abnormal Psychology (3:3:0). Prerequisite: 6 hours of psychology. Personality deviations and maladjustments; emphasis on clinical descriptions of abnormal behavior, etiological factors, manifestations, interpretations, and treatments.

4307. Experimental Psychology (3:2:3). Prerequisite: PSY 1300, MATH 2300 or equivalents. A lecture-laboratory course considering the problems of experimentation in clinical, social, and experimental psychology upon animals and human subjects.

4316. History of Psychology (3:3:0). Prerequisite: PSY 1300; recommended: senior standing. A survey of the history of psychology with emphasis on the evolution of contemporary viewpoints and methods.

4319. Human Learning (3:3:0). Prerequisite: PSY 1300 or EPSY 3330. An investigation of the research dealing with human learning, particularly in relation to education, training, and conditioning. Emphasis will be on higher types of problem solving, programmed instruction, retention, motor skills, and language skills. Applied emphasis.

4321. Interviewing Principles and Practices (3:3:0). Prerequisite: 6 hours of psychology or consent of instructor. Review of principles. Emphasis on skills which will apply directly to interview situations, such as industrial, clinical, and vocational counseling. Demonstration, recordings and discussion.

4323. Perception (3:3:0). Prerequisite: 6 hours of psychology. A survey of the methods, findings, and principles in field of sensation and perception. Attention given to underlying neurological mechanisms associated with perception. Brief survey of theories of perception.

4324. Cognition (3:3:0). Prerequisite: PSY 1300. This course represents an emergent synthesis of the traditional areas of perception, learning, and human performance. This new area concerns itself with higher level human cognition. Data and theory for the topics of creativity, concept learning, cognitive skills, and attention will be covered.

4326. Individual Problems Course (3). Prerequisite: Prior consent of instructor and high scholastic achievement. Independent work under the individual guidance of a staff member. May be repeated for up to 6 hours credit.

4328. Tests and Measurements (3:3:0). Prerequisite: MATH 2300 or equivalent. Survey of principles and practices of psychological testing. A review of statistical bases and survey of ethical standards. Instruction in the selection, administration, scoring, interpretation, and reporting of group tests of intelligence, achievement, and interest and personality inventories.

4329. Drugs, Alcohol, and Behavior (3:2:2). Prerequisite: PSY 1300 or consent of instructor. Survey of psychological factors involved in drug use and an introduction to chemotherapy used in treatment of mental illness.

4330. Psychology of Lifespan Development and Aging (3:3:0). Designed to give an overview of the physiological, cognitive, social-role, and motivation changes that occur with age from a psychological development viewpoint.

4333. Principles of Behavior Management (3:3:0). Prerequisite: 6 hours of psychology or consent of instructor. Introduction to behavior analysis, behavior therapy, and cognitive approaches to behavior management. Supervised experiences

in methods of self-control, treatment of addictive states, anxiety reduction, and applications for home, school, and institutionalized settings.

4334. Introduction to Counseling and Psychotherapy (3:3:0). Prerequisite: 6 hours of psychology or consent of instructor. Survey of current practice and theory in counseling and psychotherapy. Consideration of the research support for counseling and psychotherapy as an agent of change of behavior.

4336. Research in Personality and Social Psychology (3:2:2). Prerequisite: PSY 3403 or MATH 2300 and either PSY 3304 or 3306. An in-depth examination of selected substantive research areas in experimental personality and social psychology. Surveys of current research literature and design and execution of empirical studies.

4338. Physiological Psychology (3:1:4). Prerequisite: PSY 3327. Introduction to stereotaxic surgery, brain stimulation, electroencephalography, and other basic laboratory techniques used by physiological psychologists.

Department of Sociology

Professor H. Paul Chalfant, Chairperson.

Professors Cartwright, Lowe, and Peek; Associate Professors Chandler, Curry, Davies, Heller, Matthews, Morrissey, Noble, Palmer, Roper, and Tsai; Assistant Professors Elbow and Roberts.

This department supervises the following degree programs: SOCIOLOGY, *Bachelor of Arts, Master of Arts;* SOCIAL WELFARE, *Bachelor of Arts.* The department also participates in the LATIN AMERICAN AREA STUDIES degree program as well as in the urban studies, ethnic studies, environmental studies, and family life studies minor programs.

A student majoring in sociology must complete 30 hours in sociology; 18 hours should be advanced. Specific course requirements are as follows:

I. SOC 1301, 3391, and 3392.

II. At least 6 hours chosen from SOC 3393, 3394, 4391. Students expecting admission to graduate work in sociology should take all three of these courses.

A student minoring in sociology must complete 18 hours of sociology, including SOC 1301.

Students must receive a grade of C or better in each advanced course in sociology (all courses numbered 3000 or higher) if they wish it to count toward a major or minor in sociology. Students anticipating graduate work should, in addition, take MATH 2300 (or equivalent).

The minimum prerequisite for all advanced courses is SOC 1301 or consent of instructor, unless otherwise indicated in the course description. Freshmen and sophomores who wish to take an advanced course are additionally required to obtain the consent of the instructor in writing.

Teacher Education. Sociology may be used as a teaching field for a secondary teaching certificate, requiring a minimum of 24 hours course work. In addition, sociology is part of the program for social science in the broad field (Plan II) program for secondary teacher certification and as a field of specialization in elementary education. For specific courses, consult the education advisor of the department in Room 159, Holden Hall.

Social Welfare. The B.A. degree program in social welfare is accredited by the Council on Social Work Education. The curriculum is based on the generalist social worker model and prepares the graduate for entry into the beginning level of professional social work practice in public and voluntary social agencies. The curriculum also may serve as preparation for those qualified students who seek entry to graduate schools of social work. The foundation for the social welfare degree is found in the liberal arts, humanities, and biological and social sciences.

Students majoring in social welfare will complete a total of 36 semester hours in the social welfare curriculum. Courses required of all majors are S W 2301, 3311, 3332, 3333, 3334, 3339, 4311, 4321, 4611, and 4612. Students wishing to enter the social welfare program must apply to the director of the program in the second semester of their sophomore year. Information on the criteria and procedures for admission may be obtained from the program's director. Transfer students should contact the program's director for individualized information on admission.

Social welfare majors must complete a minor of 18 semester hours in sociology. Students with specific career goals may have a different minor approved by the social welfare faculty advisor, following normal advisement procedures. SOC 1301 and 3324 are required of social welfare students minoring in sociology. In addition, all minimum general and distributive requirements for the B.A. degree must be met.

Courses in Sociology. (SOC)

1301. Introduction to Sociology (3:3:0). Human group behavior, influence on the individual, and relationships of individuals to each other as members of groups.

1320. Current Social Problems (3:3:0). Problems in basic social institutions as marriage and the family, community, economy, government, education, health and welfare, recreation, etc.

2331. The Sociology of Marriage (3:3:0). History, present status, and current problems of the marriage institution.

3321. Sociology of Poverty (3:3:0). Study of the organization, culture, and problems of the poor. Special emphasis placed on structural aspects of poverty.

3322. Use of Census Data (3:3:0). Basic tools of demographic analysis and the elements of population structure; differential birth and death rates; rates of population increase.

3323. Law and Society (3:3:0). Study of the relationship of legal institutions to modern society; major types of law as solutions to human problems.

3324. American Minority Problems (3:3:0). Sociological analysis of the major racial or ethnic groups in the present United States.

3325. Women in the Modern World (3:3:0). Prerequisite: SOC 1301. Course treats women as group with unique sex role socialization, work, family, and political experience. Emphasis on women in contemporary United States.

3331. Sociology of the Family (3:3:0). Changing family life styles, mate roles, parent-child relationships, adoption, abortion, population control, technical-industrial impact on American family unit.

3332. Sociology of Bureaucracy (3:3:0). Governmental and industrial bureaucracies, their internal structure, formal and informal group relations, processes of communication, and mechanisms of control.

3334. Work and Occupations (3:3:0). Problems of morale and efficiency; focus on occupational careers in terms of their societal context and personal techniques of adaptation.

3337. Inequality in America (3:3:0). Inequality as expressed in occupational, class, ethnic, and sexual hierarchies is examined from varying sociological perspectives.

3338. Sociology of American Sport (3:3:0). Prerequisite: SOC 1301. Looks at sport in its relationships with other aspects of society such as education, the economy, and class and ethnic relations.

3339. Leisure and Popular Culture (3:3:0). Relation of leisure to other aspects of social life such as work, art, morality. Current technological influences on American leisure.

3352. Social Change (3:3:0). Analysis of changes in contemporary societies with emphasis on the technological, economic, political, and cultural. Theories and strategies of change.

3361. Rural Life (3:3:0). Organization, structure, and change in modern and traditional rural societies; special emphasis on community development.

3391. Introduction to Social Research I (3:3:0). Nature of research process; elementary problems of design; data collection and analysis; interpretation of research.

3392. Introduction to Social Research II (3:3:0). Prerequisite: SOC 3391. Nature of research process; elementary problems of design; data collection and analysis; interpretation of research.

3393. Development of Sociological Theory (3:3:0). Emergence of systematic sociological theory out of social philosophy; evolution of sociology as a discipline in the late nineteenth century.

3394. Contemporary Sociological Theories (3:3:0). Review of major present-day perspectives on society, including structural functionalism, conflict theory, symbolic interactionism. Occasional consideration of emerging perspectives, such as ethnomethodology, phenomenology, and sociobiology.

4307. Individual Studies in Sociology (3). Prerequisite: Consent of instructor and high scholastic achievement. Independent study. May be repeated for credit.

4308. Contemporary Social Issues (3:3:0). Substantive and theoretical issues in the study of contemporary societal problems. Specific issues of immediate contemporary concern will be considered as they affect the basic institutions and structures of the society. May be repeated for credit as topic varies.

4325. Criminology (3:3:0). Crime and deviant behavior as a social process and their regulation in a democratic society.

4326. Native Americans Today (3:3:0). Prerequisite: 6 hours of sociology or anthropology. The evaluation of American Indians viewed as a minority from a sociological perspective, both past and present.

4327. Juvenile Delinquency (3:3:0). Delinquency is reviewed as a form of deviant behavior. Attention is given to prevalent theories of causation, distribution, and frequency of delinquency, and the treatment, prevention, and control of delinquent patterns of behavior.

4329. Prisons and Corrections (3:3:0). The American prison is considered as a fragmented system of jails, separate state and federal institutions, and emerging public and private community facilities. The social organization of prisons, programs, treatment philosophies, and community integration, and the future of corrections are a central focus of study.

4331. Religion and Society (3:3:0). The sociological study of religious groups and beliefs. The reciprocal relationships between religious institutions and society.

4349. Comparative Family Systems (3:3:0). Prerequisite: 6 hours of sociology, anthropology, or family relations. Cross-cultural analysis of family institutions with emphasis on behavioral units, role allocation, tradition, customs, norms, and mores.

4353. Collective Behavior and Social Movements (3:3:0). Spontaneous group behavior: crowds, mobs, publics, public opinion, fads, fashions, crazes, panics; the organization of all these in social movements.

4362. Cities and City Life (3:3:0). The modern city in its ecological, cultural, and social aspects.

4371. The Sociology of the Person (3:3:0). Effects of group membership on individual behavior; emphasis on childhood and adolescent experiences in primary groups.

4373. Socialization (3:3:0). Prerequisite: Advanced standing. The process whereby individuals learn to behave willingly in accordance with the prevailing standards of their culture, emphasizing the family as the primary socialization unit.

4375. Sociology of Social Images (3:3:0). Exploration of techniques of maintaining social images in day-to-day interaction. Discussion of symbolic mechanisms utilized in role presentation (role equipment, microecology, and body language).

4381. Sickness, Health, and Society (3:3:0). The sociological study of the medical institution and its interrelationship with other societal institutions. Differential definitions of health and illness.

4382. The Sociology of Mental Illness (3:3:0). Analysis of the problems of mental health and illness from the sociological perspective. Study of sociological approaches to the definition of mental illness; the social epidemiology of mental illness, problems of recognizing and defining conditions of mental illness, and hospital and community treatment of mental illness.

4391. Opinion Polling Analysis (3:3:0). Students use computers in analysis of survey data and write research reports. Open to nonmajors.

4395. Sociology of Knowledge (3:3:0). Philosophical and theoretical aspects of the relationship between social conditions and modes of thought.

Courses in Social Welfare. (S W)

2301. Social Welfare as an Institution (3:3:0). Prerequisite: SOC 2301 or consent of instructor. To introduce the beginning social welfare student and other interested students to the field of social welfare by examining the historical development and perspectives of social welfare as it relates to the development of voluntary and governmental social services.

3311. Human Behavior and the Social Environment (3:3:0). Prerequisite: S W 2301 or consent of instructor. An introduction to the systems approach of how human behavior (either individually, in groups, or in communities) is shaped by internal, social, and environmental factors.

3332. Principles of Social Work Practice (3:3:0). Prerequisite: S W 2301 and 3311; corequisite: S W 3333. An introduction to social work principles, values, and relationship-building skills. Focuses on developing and maintaining working relationships through skillful communication with clients and professionals.

3333. Social Work: Profession and Interventive Means I (3:3:0). Prerequisite: S W 3311. The social work profession: its values, principles, and methods. The generic knowledge and skills necessary for the data gathering and analysis phases of the interventive process of social work problem solving.

3334. Social Work: Profession and Interventive Means II (3:3:0). Prerequisite: S W 3333. An in-depth examination of the social work methodology of social casework as an interventive means of problem solving with individuals and families.

3339. Methods of Social Research (3:3:0). Prerequisite: Junior standing or consent of instructor. May take parallel to S W 3333 or 3334. Introduction to data collection and analysis; interpretation of social data.

4311. Seminar in Social Policy and Social Legislation (3:3:0). Prerequisite: Senior standing. In-depth analysis of current issues and their accompanying social policy and social legislation as it pertains to the field of social welfare and social service delivery systems.

4321. Issues in Social Work Practice and Profession (3:3:0). Prerequisite: Senior standing or consent of instructor. Contemporary issues in the specialized study of social work practice, with emphasis on service delivery systems or methodologies. May be repeated once for credit with change in emphasis.

4611. Social Work: Field Experience I (6:1:15). Prerequisite: S W 3333 and 3334 and consent of instructor. A closely supervised beginning experience in the practice of social work methods, knowledge, and skills in a welfare or related agency. (S. W. majors only.)

4612. Social Work: Field Experience II (6:1:15). Prerequisite: S W 4611 and consent of instructor. A closely supervised advanced experience in the practice of social work methods, knowledge, and skills in a welfare or related agency. (S. W. majors only.)

Department of Speech Communication

Professor Keith V. Erickson, Chairperson.

Professors Jordan and L. Wheeless; Associate Professors Deethardt, McGuire, and Simpson; Assistant Professors Cook, Street, and V. Wheeless.

This department supervises the following degree programs: SPEECH COMMUNICATION, *Bachelor of Arts, Master of Arts.*

Study in speech communication at Texas Tech is designed to provide training in human communication for professionals in business, industry, social service, and education. The objective of this department is to produce graduates whose understanding of communication problems and solutions makes them uniquely qualified to contribute their expertise for the betterment of society. To accomplish this goal, plans are offered which allow for the study of speech communication skills and theories and their applications to problems in modern society. Within this general objective, the department recognizes that each individual student has unique educational objectives and professional goals. Therefore, a flexible and individualized plan of undergraduate study is developed to be compatible with the student's aims. The department sponsors cocurricular and extracurricular activity in forensics and oral interpretation and maintains a local chapter of Delta Sigma Rho — Tau Kappa Alpha (national forensic honorary).

Students seeking an undergraduate degree in speech communication will complete a course of study which consists of 36 hours of speech communication including 18 hours in advanced courses. Suggested minor programs within the department are as follows. For business administration majors: SCOM 2303, 3300, 3301, 3308, 3309, and 4302; for prelaw majors: SCOM 2300 or 3308, 2302, 2303, 2306 or 4309, 3309, and 4302; for English majors: SCOM 2304, 2306, 3304 or 2303, 3302 or 4302, 3306, and 4308 or 4309.

Teacher Education. Students desiring secondary certification in speech communication must complete the following: SCOM 1301, 2300, 2302, 2303, 2304, 4305, and 9 hours of electives all of which must be advanced. Students desiring to use speech as a specialization for the elementary certificate may elect Plan I (18 hours) or Plan II (24 hours). Under Plan I students must take SCOM 1301, 2303, 2306, 3300, 3304, and 3306; under Plan II students must take 6 hours of electives, 3 of which must be advanced.

Courses in Speech Communication. (SCOM)

1101. Communication Confidence (1:1:0). A practical course designed to build communication confidence and provide basic oral communication skills training. For the person who is apprehensive about comunicating with others.

1301. Interpersonal Communication (3:3:0). A study of the human communication process in one-to-one encounters. Arts and Sciences students may substitute this course for second semester sophomore English.

2300. Public Speaking (3:3:0). A course in the theory, preparation, delivery, and evaluation of public speeches.

2302. Argumentation and Debate (3:3:0). Evolution of argumentation with emphasis on modern viewpoints, application of theory to selected controversies.

2303. Small Group Communication (3:3:0). An introduction to group process and interaction, the concepts of leadership, and effective participation; group discussion as a vital process in a democracy. May be applied toward the social/behavioral sciences requirement for B. A. degree.

2304. Fundamentals of Oral Interpretation (3:3:0). Major emphasis is placed on the appreciation of good literature and its effective oral interpretation from the printed page. May be applied toward humanities requirement for B. A. degree.

2306. Male/Female Communication (3:3:0). A study of the similarities and differences of important communication variables for males and females, with practical communication applications. May be applied toward social/behavioral sciences requirement for B. A. degree.

2309. Communication in the Classroom (3:3:0). An exploration of the role of communication in the classroom; primarily designed for education majors.

3101. Parliamentary Procedures (1:1:0). Principles and procedures governing deliberative groups with practice in their usage.

3102. Forensic Activities (1:0:3). Opportunity is offered the student who wishes to participate extensively in forensic activities to secure credit for this laboratory work. May be repeated up to 4 semester hours for speech communication majors and minors; 2 semester hours for others.

3103. Oral Interpretation Activities (1:0:3). Opportunity for the student participating extensively in oral interpretation activities to secure credit for this laboratory work. May be repeated up to 4 semester hours.

3300. Nonverbal Communication (3:3:0). The study of the origin, function, and control of nonverbal, symbolic elements inherent in speech communication. May be applied toward social/behavioral sciences requirement for B. A. degree.

3302. Group Interpretation of Literature (3:3:0). Experience in working with oral interpretation within a group. Study of theory and practice in choral reading, readers theatre, and chamber theatre. May be applied toward humanities requirement for B. A. degree.

3304. Storytelling and Oral Interpretation of Children's Literature (3:3:0). A methods course designed to improve the communication of literature to children from preschool to grade six.

3305. Communication in Organizations (3:3:0). Prerequisite: SCOM 1301 or 3308 or consent of instructor. A survey of research on communication in organizations with emphasis on relevant verbal and nonverbal factors; applications to basic communication skills and rudimentary research.

3306. Intercultural Communication (3:3:0). A study of the role of cultural differences in human communication; theoretical and experential approaches toward gaining competence in communicating across cultural barriers. May be applied toward humanities requirement for B.A. degree.

3307. Behavioral Research in Speech Communication (3:3:0). Review of research in the discipline focusing on design, measurement, hypothesis testing; students will design and complete a speech communication research project.

3308. Business and Professional Speech Communication (3:3:0). Basic principles of speech applied to the communication needs of the professional person. Practice in the construction and delivery of the various types of speeches and participation in group conferences, discussions, and interviews.

3309. Interviewing: Process and Procedures (3:3:0). Principles drawn from contemporary interpersonal communication theory are specifically applied to informational, employment, and persuasive interview situations. Practical application of theoretical concepts is encouraged through in-class role-playing interviews and through analysis of actual interviewing techniques.

4300. Special Topics in Interpersonal Communication (3:3:0). Prerequisite: SCOM 1301 or consent of instructor. Advanced study of the relationship of interpersonal communication to the areas of nonverbal communication, attribution processes, relational development, verbal behavior. May be repeated for credit.

4301. Senior Projects in Speech Communication (3). Individual study, under guidance of a member of the faculty, of a specific problem of student's choice in one of the areas of speech communication. Students required, in advance of registration, to consult with the instructor and secure the department chairperson's approval of the specific project to be pursued. May be repeated once for credit.

4302. Persuasion (3:3:0). A study of the psychological and rhetorical principles of motivation, suggestion, and other aspects of audience psychology as used in business, mass media, and public affairs.

4305. Teaching Speech Communication (3:3:0). Review of the areas of speech communication. A survey of texts and a critical evaluation of their contributions to the discipline; preparation of syllabi.

4308. Topics in Oral Interpretation (3:3:0). Prerequisite: SCOM 2304 or consent of instructor. Topic emphasis may include advanced interpretation theories, readers theatre, or the history of oral interpretation. May be repeated for credit.

4309. Special Topics in Public Communication and Free Speech (3:3:0). The study of selected topics in public communication and free speech. Topics may include political communication, social movements, and first amendment issues. May be repeated for credit.

Department of Speech and Hearing Sciences

Associate Professor Earlene T. Paynter, Chairperson.
Professors Ickes and Muma; Associate Professors Arwood, Hamre, and Olsen; Assistant Professors Jones, Strauss, and Weber-Olsen; Visiting Instructor Crump; Part-time Instructor Wilson.

This department supervises the following degree programs: SPEECH AND HEARING SCIENCES, *Bachelor of Science in Speech and Hearing Sciences, Master of Science in Speech and Hearing Sciences.*

This department provides preprofessional education at the undergraduate level and professional training at the graduate level for students seeking careers in speech and hearing sciences. The program is designed to meet certification standards of the American Speech-Language-Hearing Association. Students interested in a speech pathology or audiology career should note that it is a violation of the Code of Ethics of the American Speech-Language-Hearing Association to provide services to the communicatively impaired without having met both the minimum academic requirement of a master's degree in speech and hearing sciences and the minimum clinical requirement of having acquired 300 clock hours of supervised clinical practice.

The department offers professional training at the undergraduate level in education of the hearing impaired, a program which has been designed to meet standards of the Council on Education of the Deaf.

This department sponsors the National Student Speech and Hearing Association (speech pathology and audiology professional), the Texas Tech student chapter of the American Organization for the Education of the Hearing Impaired (professional section of the Alexander Graham Bell Association for the Deaf), and the Speech-Language and Hearing Clinic which serves as a laboratory for speech-language and hearing clinical practicum and provides communicative disorders service to the West Texas region. Student teaching and other practicum is available through various satellite and externship programs in other existing community and state agencies and in the Texas Tech University School of Medicine.

Students seeking the B.S.S.H.S. degree may pursue one of two courses of study: they may elect a speech and hearing science concentration that does not lead to certification in any professional area or they may apply for the preprofessional program in speech-language pathology, audiology, or education of the hearing impaired. Students wishing to enter a preprofessional program must apply for admission to the program through the department during their sophomore year or, if they are transfer students, during their first semester of attendance at Texas Tech. Preprofessional students will be admitted to these programs by a departmental selection committee. Ordinarily, such students will have to show intent to pursue graduate study and maintain at least a 3.0 grade-point average. Clinical practicum courses are limited to students who are admitted to the preprofessional program.

Students seeking the B.S.S.H.S. degree must complete certain requirements in the major for the following programs.

Audiology: SHS 1320, 2120, 2321, 2322, 2323, 3324, 3341, 4342, 4426, and electives in the speech and hearing sciences to total 39 hours.

Education of the Hearing Impaired (Deaf Education): SHS 1310 or 2120, 2311, 2321, 2322, 2323, 3341, 3350, 3351, 3352, 3353, 3354, 4342, 4358, and electives in the speech and hearing sciences to total 39 hours.

Speech-Language Pathology: SHS 1320, 2120 (twice), 2321, 2322, 2323, 3324, 3325, 3341, 4342, 4426, 4427, and electives in the speech and hearing sciences to total 39 hours.

In addition to the above, students in a preprofessional program must complete at least 6 hours in SHS 4380 or 4390. Students wishing to enroll in clinical practicum must arrange with the clinic director the semester before enrolling or, if they are transfer students, before registration.

Teacher Education. In addition to the preprofessional program, students seeking a public school teaching certificate in deaf education must complete 36 hours of professional educational course work and student teaching (elementary level) or 24 hours in a teaching field, 12 hours of professional education, and student teaching (secondary level). Students will qualify for a certificate to teach the hearing impaired in addition to certification as either an elementary or a secondary level teacher of normal-hearing children.

Students seeking a public school certificate in speech-language pathology or audiology may do so by completing the M.S. degree in speech and hearing sciences and 21 semester hours in education including 6 hours of student teaching at

the graduate level. Students who anticipate enrolling for student teaching must file an application of intent by April 15 of the preceding academic year.

Teacher certification and degree programs are two distinct programs. Students should consult the sections on "Admission to the Teacher Education Program" and "Certification Plan" in the Teacher Education portion of this catalog.

Courses in Speech and Hearing Sciences. (SHS)

1310. A Beginning Course in Sign Language I (3:3:0). An introduction to American sign language using the simultaneous method of communication (fingerspelling, signs, speech).

1311. A Beginning Course in Sign Language II (3:3:0). Prerequisite: SHS 1310 or equivalent proficiency. Continuation of SHS 1310 with improvement of expressive and receptive skills. Better fluency in manual communication and receptive practice in a conversational manner is emphasized.

1320. Introduction to Communication Disorders (3:3:0). An introduction to speech, language, and hearing disorders and methods of management in public schools and other settings. Concurrent enrollment in SHS 2120 required.

2120. Supervised Observation in Speech-Language Pathology and Audiology (1). Supervised observation of clinical assessment and management of individuals with communication disorders. May be repeated for credit.

2310. A Second Course in Sign Language I (3:3:0). Prerequisite: SHS 1311 or equivalent proficiency. A comprehensive study of English idioms translated into sign language in a communicative setting stressing receptive skills.

2311. A Second Course in Sign Language II (3:3:0). Prerequisite: SHS 2310 or equivalent proficiency. Additional study of sign language idioms and colloquialisms in conversational sign language with an emphasis on Ameslan.

2321. Speech Science and Phonetics (3:3:0). A study of the physics of speech production and the psychology of speech reception. Topics include the properties of sound, speech acoustics and speech perception, and speech sound transcription using the International Phonetic Alphabet.

2322. Speech Anatomy and Physiology (3:3:0). Study of the structural and physiological aspects of speech production including neuroscience, respiration, and phonatory dynamics.

2323. Normal Aspects of Language Acquisition (3:3:0). Introduction to current theories of language and language development, including methods of obtaining and analyzing language samples.

3324. Language and Articulation Disorders: Assessment/Intervention (3:3:0). Prerequisite: SHS 1320, 2321, 2323, or consent of instructor. Emphasis on childhood language disorders. Topics covered are the nature and etiologies of language disorders and principles of assessment and treatment; clinical applications of cognitive, communicative, and linguistic systems.

3325. Fluency, Voice, and Resonance Disorders (3:3:0). Prerequisite: SHS 1320, 2321, 2322, or consent of instructor. Study of characteristics, theories of etiology, and clinical management principles pertinent to stuttering, cluttering, voice disorders, and resonance disorders.

3341. Introduction to Hearing Problems (3:3:0). Anatomy of the ear. Definition and description of types of hearing loss and deafness. Principles and methods of clinical and classroom retraining of the hard-of-hearing through lip reading, auditory training, and speech correction.

3350. Hearing Impairment: Psychosocial Aspects (3:3:0). Examination of the psychosocial, sociological, and motoric characteristics of the hearing impaired population and the communicative problems associated with hearing impairment.

3351. Hearing Impairment: Educational Aspects (3:3:0). Prerequisite: SHS 3350. Trends and issues in education of the hearing impaired; parent-infant intervention, curriculum materials, methods, P. L. 94-142, use of sign systems.

3352. Aural Habilitation (3:3:0). Prerequisite: Junior standing; concurrent enrollment in SHS 3353 and 3354. Aural habilitative procedures: communication, visual speech signals, and use of residual hearing.

3353. Development of Auditory/Oral Communication (3:3:0). Prerequisite: Junior standing; concurrent enrollment in SHS 3352 and 3354. Analysis of speech production in hearing impaired: readiness, voice, breath, articulation, rhythm, phrasing, accent, and fluency.

3354. Hearing Impairment: Psycholinguistics (3:3:0). Prereqisite: Junior standing; concurrent enrollment in SHS 3352 and 3353. Examination of language acquisition, assessment, and intervention strategies for the hearing impaired population.

4300. Senior Projects in Speech Pathology and Audiology (3). Prerequisite: Senior classification and 9 hours in the area of speech pathology and audiology. Individual study, under guidance of a member of the faculty, of a specific problem of student's choice in one of the areas of speech disorders. Students required, in advance of registration, to consult with the instructor and secure approval of the specific project to be pursued. May be repeated for credit.

4342. Principles of Audiometry (3:3:0). Prerequisite: SHS 2321, 3341, or consent of instructor. An introduction to the measurement of hearing sensitivity including air and bone testing, speech testing, and masking. Includes an introduction to impedance measurements of middle ear systems.

4380. Clinical Practicum: Speech-Language Pathology (3). Prerequisite: SHS 2120 or consent of clinical director. Supervised, direct clinical experience in case management. May be repeated for credit. A minimum of 6 credits is required of students seeking certification in speech-language pathology.

4390. Clinical Practicum: Audiology and Aural Rehabilitation (3). Prerequisite: SHS 2120 or consent of clinical director. Supervised case management. May be repeated for credit. A minimum of 6 credits is required of students seeking certification in audiology.

4426. Neural Bases of Speech and Language Disorders (4:3:2). Prerequisite: SHS 1320, 2321, 2322, or consent of instructor. A study of neural bases of normal and pathological speech and language, including management of apraxias, dysarthrias, and adult aphasias.

4427. Assessment Procedures in Speech-Language Pathology (4:3:1). Prerequisite: SHS 1320, 2321, 2322, or consent of instructor. An introduction to assessment of communication disorders of speech and language. Laboratory assignments provide experience in testing, specific assessments and observation techniques, and report writing.

4670. Hearing Impaired: Externship (6). Prerequisite: Admission to preprofessional program and completion af all course work; concurrent enrollment in ECEL 4691 or EDSE 4692. Supervised teaching experience with hearing impaired children and youth.

Department of Theatre Arts

Professor Richard A. Weaver, Chairperson.

Professor Ashby; Associate Professors Gerlach, Newlin, and Sorensen; Assistant Professor Fuselier.

This department supervises the following degree programs: THEATRE ARTS, *Bachelor of Arts, Bachelor of Fine Arts, Master of Arts, Master of Fine*

Arts. The area also participates in the *Doctor of Philosophy* degree in FINE ARTS with an option in Theatre Arts.

The department sponsors a major season of plays in the University Theatre, a season of experimental and student-directed plays in the Laboratory Theatre, a Summer Repertory program, and various workshops. In addition, it sponsors Alpha Psi Omega (national theatre honorary), is an institutional member of the Texas Educational Theatre Association, the Southwest Theater Conference, and the American Theatre Association.

Students seeking the B.A. degree must complete the following requirements in addition to those required by the College of Arts and Sciences: TH A 1101, 1102, 1103, 1301, 2101, 2302, 2303, 3101, 3102, 3103, 3303, 3304, 3305, 3308, 3309, 4302, and additional electives to total 36 to 42 hours. All courses in the student's major must be completed with a minimum grade of C. A minimum of 2 hours in dance and/or fencing offered in the Department of Health, Physical Education, and Recreation is also required. For a minor in theatre arts the following courses are required: TH A 1101, 1103, 2101, 2302, 3303, 3304, 3305, 4302.

Students seeking the B.F.A. degree may select from specializations in acting/directing or in design. The following requirements must be completed. A minimum of 141-143 hours are required, at least 40 of which must be at the junior and senior levels.

General Degree Requirements

English	12 hours
Physical education	2 hours
Political science	6 hours
American history	6 hours
*Mathematics, foreign language, natural science (select two areas)	12-16 hours
*Philosophy, psychology, sociology, anthropology (select two or three areas)	6-12 hours
*Electives (dramatic literature courses in English and foreign languages are recommended)	8-18 hours

Core Requirements

TH A 1101, 1102, 1103, 1104, 2101, 2302, 2303, 3104, 3105, 3303, 3304, 3305, 3308, 3309, 4302, 4303.

Acting/Directing Specialization Courses

TH A 1301, 2302 (repeated), 3105 (three times), 3302 (twice), 3306, 3307, 4301 (twice). In addition, students must select 6 hours from SCOM 2304, 3103, 3302, 4308, M AP (voice) 1001, 1002, 2001, 2002; 5 hours from P E 1103,

*Must total 36 hours in combination

1104; and 9 hours from SCOM 2304, 3103, 3302, 4308, M AP 1001, 1002, 2001, 2002, DAN 1102, 1103, 1107, 1204, 1304, 2102, 3201, 4102, 4104, 4207, P E 2200.

Design Specialization Courses

TH A 3101, 3102, 3103, 3306, 3307, 4301 (twice), 4308, 4309, ART 1320, 1324, 1325, 1331, and 2322. Also, 9 hours must be selected from ART 1310, 1311, 1320, 1324, 1325, 1331, 2320, 3310, 3312, 3313, 3314, 3338, 3340, 3343, 3345, 3375, C&T 2208, 2301, 2303, 2307, 3302, 3307, 4303, 4306, 4307, 4330, ARCH 2312, 4314, 4315.

Teacher Education. Students desiring secondary certification in theatre arts must complete the following: TH A 1301, 2302, 2303, 3303, 3304, 3305, 3308, 3309, 4302, and 4307.

Courses in Theatre Arts. (TH A)

1101. Theatre Activities: Scenery/Properties (1). Opportunity to participate extensively in theatre activities in scenery and properties.

1102. Theatre Activities: Lighting/Sound (1). Opportunity to participate extensively in theatre activities in lighting and sound.

1103. Theatre Activities: Costume/Makeup (1). Opportunity to participate extensively in theatre activities in costume and makeup.

1104. Theatre Activities: House Management (1). Opportunity to participate extensively in theatre activities in the area of house management.

1301. Voice for the Actor (3:2:3). An introductory course in voice improvement emphasizing practical training for actors and announcers.

2101. Stage Makeup (1:0:3).

2301. Introduction to Acting (3:2:3). Acting techniques in communication processes. May be applied toward the fine arts requirement for the B.A. degree.

2302. Principles of Acting (3:2:3). Study and application of the theories and techniques of the art of acting. May be repeated for credit.

2303. Introduction to Theatre and Cinema I (3:3:0). A study of the modern theatre and cinema art forms, with attention to the historical background and social and aesthetic values. Emphasis is placed on theatre. Attendance at representative plays and motion pictures is required. May be applied toward fulfilling fine arts requirement for B.A. degree.

2304. Introduction to Theatre and Cinema II (3:2:2). Continuation of TH A 2303 with emphasis on cinema. One lecture, one hour of discussion, and a two-hour viewing session each week. May be applied toward fulfilling the fine arts requirement for the B.A. degree.

3101. Advanced Theatre Activities: Scenery/Properties (1). Opportunity to participate extensively in theatre activities in scenery and properties with emphasis on leadership experiences.

3102. Advanced Theatre Activities: Lighting/Sound (1). Prerequisite: TH A 3304. Opportunity to participate extensively in theatre activities in lighting and sound with emphasis on leadership experiences.

3103. Advanced Theatre Activities: Costume/Makeup (1). Prerequisite: TH A 3305. Opportunity to participate extensively in theatre activities in costume and makeup with emphasis on leadership experiences.

3104. Advanced Theatre Activities: House Management (1). Opportunity to participate extensively in theatre activities in house management with emphasis on leadership experiences.

3105. Rehearsal and Performance (1). Credit for acting in University Theatre and Laboratory Theatre productions. May be repeated for credit.

3106. Auditioning (1:0:2). Prerequisite: TH A 1301 and 2302. A practicum for developing audition techniques and examining guidelines for audition procedures, with emphasis on resume organization and audition material selection and performance.

3302. Advanced Acting (3:2:3). Prerequisite: TH A 1301, 2302. Continuation of the study and application of the theories and techniques of the art of acting, with emphasis on characterization, analysis of roles, and techniques and types of performance. May be repeated for credit.

3303. Principles of Theatrical Scenery (3:2:3). Prerequisite: TH A 2303 or equivalent. The study of technical problems of play production. Design, construction, and painting of scenery and properties and special effects.

3304. Principles of Theatrical Lighting (3:2:3). Prerequisite: TH A 2303 or equivalent. Study of the theory and practice of theatrical stage lighting. Elementary electricity, lighting control and instruments, lighting design.

3305. Principles of Theatrical Costuming (3:2:3). Prerequisite: TH A 2303 or equivalent. Study and application of the theories and techniques of theatrical costuming. Survey of historical dress. Design for the stage. Construction of theatrical clothing.

3306, 3307. Practicum in Repertory Theatre I, II (3:0:9 each). Prerequisite: TH A 1301, 2302, 2303, or equivalent. Practical work in the organization, mounting, and presentation of plays in a repertory situation. May be repeated for credit.

3308. History of Theatre I (3:3:0). A comprehensive review of world theatre from its beginning to the seventeenth century. May be applied toward fulfillment of fine arts requirement for the B.A. degree.

3309. History of Theatre II (3:3:0). A comprehensive overview of world theatre from the seventeenth century to the present day. May be applied toward fulfillment of fine arts requirement for the B.A. degree.

4301. Senior Projects in Theatre Arts (3). Prerequisite: Senior standing and 9 hours in theatre arts. Individual study, under guidance of a member of the faculty, of a specific problem of student's choice. Students required, in advance of registration, to consult with the instructor and secure the Director of Theatre's approval of the specific project to be pursued. May be repeated once for credit.

4302. Stage Directing Methods (3:2:3). Prerequisite: Junior standing, TH A 2302, 2303, 3303, 3304, and 3305. Study and practice of fundamental principles and techniques of directing. Student direction of representative plays.

4303. Theory and Practice of Playwriting (3:3:0). Study of the techniques of dramaturgy. Practical work in the writing of drama. May be repeated for credit.

4304. Creative Dramatics (3:3:0). Studies in the principles and methods of developing original dramatizations with children.

4307. Teaching Theatre in the Secondary School (3:3:0). Prerequisite: 21 hours of theatre arts and 9 hours of education. The application of teaching methods and techniques to theatre arts, and the preparation of syllabi.

4308. Scene Painting (3:2:3). Prerequisite: TH A 2303, 3303, and 3304.

4309. Principles of Scene Design (3:2:3). Prerequisite: TH A 2303, 3303, and 3304. Study of theory and practice of theatrical scene design.

Reserve Officer Training Corps

The Department of Military Science and the Department of Aerospace Studies conduct senior division Reserve Officer Training Corps programs under the administration of the College of Arts and Sciences. These programs provide students the opportunity to learn more about the United States military and its place in American society today. They also allow qualified students to pursue a program of studies and learning experiences leading to an officer's commission in either the Army or the Air Force.

The first two years of courses in both ROTC programs are open to all U.S. citizens who are accepted as full-time students by the University. There is no military commitment or obligation incurred with these courses. The courses may be substituted for the University's physical education course requirements. The courses in the freshman and sophomore years are referred to as the Basic Course, while the junior- and senior-level courses are called the Advanced Course.

To enter the Army Advanced Course, students must have completed the Basic Course or have received constructive credit by having completed either a four-year JROTC program, an Army ROTC Basic Camp, Armed Forces Basic Training (and be enlisted in the Reserve or Texas National Guard), or be an honorably discharged veteran. For the Air Force Advanced Course, students must complete the Basic Course and attend an Air Force summer camp. Detailed information about the alternative programs is available from the chairperson of either department. Advanced Course students receive a monthly stipend of $100 for up to 10 months per year.

In addition to completing the above requirements, students who wish to enroll in the ROTC Advanced Course must be citizens of the United States, be not less than 17 years of age, be able to complete work for a baccalaureate degree and all other requirements for commissioning prior to their 30th birthday (for Air Force, by the time they are 26 years, 6 months old if programmed for flight training; up to 34 years old with waiver if programmed for other than flight training), have a cumulative GPA of 2.0 or higher, pass all military aptitude tests as required, be physically qualified, be enrolled as a full-time student, and be approved by the Professor of Military Science or Professor of Aerospace Studies, as appropriate. Upon admission into the Advanced Course, students sign a contract to accept a commission as a second lieutenant upon completion of the Advanced Course.

One feature of the Advanced Course is a summer training camp. Students normally attend the six-week Army Advanced Camp between their junior and senior years. However, the Air Force camps are of four or six weeks' duration, scheduled throughout the summer, and are normally attended between the student's sophomore and junior years.

Scholarships. The Departments of Army and Air Force offer 4-year ROTC scholarships to selected high school seniors on a competitive basis. Additionally, the Army offers 3, 2, and 1 year scholarships to outstanding cadets selected by the Professor of Military Science and a board of Army and University officials. Eligible freshman and sophomore AFROTC cadets may apply for 3½, 3, 2½, and 2 year scholarships once in the program. Other 2 year scholarships are available to qualified Advanced Course students in both services. ROTC scholarships provide textbooks, tuition, and fees as well as a monthly subsistence allowance of $100.

Flight Training. During their junior year pilot candidates in Air Force ROTC will receive flight training in a standardized flight instruction program approved by the Federal Aviation Agency. The course consists of ground and flight instruction, both given on an extracurricular basis. Students completing the course are given the opportunity to qualify for a Federal Aviation Agency private pilot's certificate. During their senior year, Army ROTC students may apply to attend flight school following commissioning and entry into active service.

Commissioning. Upon receiving a commission, the Army ROTC student agrees to serve 3 years on active duty and 3 years in the Reserve (nonscholarhsip cadets), or 4 years on active duty and 2 years in the Reserve (scholarship cadets). The Army ROTC student may request active duty for training only (3-6 months) and then serve with a Reserve or National Guard unit near his home. The Air Force cadets agree to serve 4 years on active duty in a nonflying capacity, 6 years upon completion of undergraduate pilot training, or 5 years upon completion of undergraduate navigator training.

Military Studies Minor. A Military Studies minor is available in the College of Arts and Sciences and the College of Business Administration with the General Business major. It consists of 18 semester hours taken in Aerospace Studies, Military Science, Military History, or a combination thereof.

Department of Aerospace Studies

Col John S. Kubin, Professor
Assistant Professors Capt Blair, Capt Byrd, Capt Davis, and Capt Tarter.

The Air Force Reserve Officer Training Corps curriculum is designed to educate university men and women for careers as Air Force officers and to develop quality graduates with a sense of dedication. The ability to think and communicate effectively in their preparation for and acceptance of officer responsibilities is of utmost importance in the Department of Aerospace Studies.

The purposes and specific objectives of the Air Force ROTC program are (a) to select and motivate cadets to serve as career officers in specialty areas required by the U.S. Air Force; (b) to develop in cadets by example, discussion, and participation the character, personality, and attitudes essential for leadership; (c) to develop in cadets an interest in and understanding of the Air Force mission, organization, operations, problems, and techniques; and (d) to provide military education which will give cadets a general background and sound foundation on which to build an officer career.

All courses in the program are taught by Air Force officers possessing graduate degrees.

General Military Course. This course, consisting of the first two years, examines the role of the U.S. military forces in the contemporary world with particular attention to the U.S. Air Force — its organization and mission. The functions of strategic offensive and defensive forces, general purpose and aerospace support forces are covered in the first year. In the second year, the historic development of air power is studied.

Supplemental Course Requirements. All GMC contract cadets (scholarship students) must successfully complete at least one 3-credit hour course in

English composition and one 3-credit hour course in an approved foreign language. Prior to commissioning all cadets must successfully complete at least one 3-credit hour course in mathematical reasoning.

Professional Officer Course. This course introduces the cadet in the first year to a study of Air Force leadership in the junior officer level including its theoretical, professional and legal aspects, and a study of military management functions, principles, and techniques. The second year is a study of national defense policy and strategy. Additional subjects cover the military profession and its relationship to American society. Within this program, attention is devoted to developing communicative skills and providing leadership experiences in officer-type activities.

Entrance to the professional officer course is limited to those who are regularly enrolled in the University, who have completed the necessary screening, testing, physical examination, and who have completed the general military course or the preenrollment six-week field training for two-year applicants, or who receive credit for prior military service.

Cadets who complete the professional officer course are tendered appointments as second lieutenants, Reserve of the Air Force, upon graduation.

Awards and Recognition. A number of awards, trophies, and decorations are presented each year to outstanding AFROTC cadets during a suitable military ceremony by military and civilian leaders. The awards, presented to recognize achievement and to encourage competition, are given to recipients chosen by the Professor of Aerospace Studies, his staff, and the Cadet Staff. The President's Award is presented annually by the President of the University to the outstanding professional officer course cadet who has achieved a high academic standing and materially contributed to student life during his or her university career. The Professor of Aerospace Studies Leadership Awards go each regular semester to the junior and senior cadets who have demonstrated outstanding leadership within the Cadet Corps. Cadets showing outstanding qualities of leadership, high moral character, definite aptitude for military service, academic excellence, and maintain their high standards of performance until graduation are designated Air Force Reserve Officer Training Corps Distinguished Graduates.

Sabre Flight. The Sabre Flight is an organization of AFROTC students composed primarily of freshmen and sophomores. It is an integral part of the program and its basic mission is to promote interest in the AFROTC. Members of the flight participate regularly in color and honor guard formations and precision drill activities.

Arnold Air Society. This professional honorary service organization of selected AFROTC cadets participates in a variety of service functions for the University and the community. Its objective is to create a closer and more efficient relationship with the AFROTC and to promote interest in the Air Force.

Angel Flight. The Angel Flight is an organization of University women sponsored by the Arnold Air Society. Its mission is to promote interest in the AFROTC program. A noted feature of the Angel Flight is its precision drill team. Membership selection is based on poise, personal appearance, personality, scholastic standing, and marching ability.

Field Training. AFROTC field training is offered during the summer months at selected Air Force bases throughout the United States. Students in the four-year program participate in four weeks of field training during the summer, usually between the sophomore and junior year. Students applying for entry into the two-year program must successfully complete six weeks of field training prior to enrolling in AFROTC. The major areas of study in the field training program include junior officer training, aircraft and aircrew orientation, career orientation, survival training, base functions and Air Force environment, and physical conditioning. The six-week field training also contains the General Military Course academic curriculum and Leadership Laboratory.

Courses in Aerospace Studies. (AERS)

FIRST YEAR

1105. The Air Force Today (1:1:1½). A survey course that deals with the mission, organization, and function of the American military, especially as it applies to the United States Air Force.

1106. The Air Force Today (1:1:1½). A survey course that deals with the Air Force in the contemporary world through a study of the total force structure, strategic offensive and defensive forces, general purpose forces and aerospace support forces.

SECOND YEAR

2103. The Devlopment of Air Power I (1:1:1½). A study of the development of air power from the origin of man's desire to fly through the air war in WWII and the peaceful employment of U.S. air power.

2104. The Development of Air Power II (1:1:1½). A study of the development of air power from WWII through the air war in Vietnam and the peaceful employment of U.S. air power.

THIRD YEAR

3305. Air Force Leadership and Management (3:3:1½). An introductory management course emphasizing the individual as a manager in the Air Force. Individual motivation and behavioral processes, leadership, communication, and group dynamics are covered to provide a foundation for the development of the junior officers' professional skills as an Air Force leader.

3306. Air Force Leadership and Management (3:3:1½). Leadership theory and management practice are amplified through study of management of forces in change, organizational power, and managerial strategy and tactics.

FOURTH YEAR

4303. National Security Forces in American Society (3:3:1½). Focuses on the Armed Forces as an integral element of the American society, with emphasis on the broad range of American civil-military relations and the environmental context in which the U.S. defense policy is formulated and implemented. Semester themes include societal attitudes toward the military leader-manager in the democratic society and the fundamental values and socialization processes associated with the Armed Services.

4304. National Security Forces in American Society (3:3:1½). Focuses on the Armed Forces as an integral element of American society, with emphasis on the broad range of American civil-military relations and the environmental context in which U.S. defense policy is formulated and implemented. Semester themes include the requisites for maintaining adequate national security forces; political, economic, and social constraints on the national defense structure; the impact of

technological and international developments on strategic preparedness; and the manifold variables involved in the formulation and implementation of national security policy. Military justice and administrative law are discussed within the context of the military organization.

LEADERSHIP LABORATORY

Instruction is conducted within the framework of an organized cadet corps with a progression of experiences designed to develop each student's leadership potential. Leadership Laboratory involves a study of Air Force customs and courtesies; drill and ceremonies; career opportunities in the Air Force; and the life and work of an Air Force junior officer. Students develop their leadership potential in a practical, supervised laboratory which typically includes field trips to Air Force installations throughout the U.S. Students who enroll in aerospace studies courses must also enroll in a corresponding Leadership Laboratory section. Contact the Aerospace Studies Department for details.

Department of Military Science

Professor Thomas R. Hamilton, Chairperson.
Assistant Professors Corbell, Davis, Finley, Lew, Lindsey, and Ross.

The first two years of study are designed to allow students to observe and experience motivation techniques and human relations practices specifically developed to assist them in their adjustment to the college environment. The courses also permit students to develop certain outdoor skills that will be of benefit throughout their lives. These skills include land navigation using a magnetic compass and topographic map, weapon safety and marksmanship, first aid, backpacking, aerobic conditioning, and rappelling. Students will also investigate the structure of the Army and its relationship within American society. Faculty and guest speaker presentations will compare the Soviet soldier's life-style and training activities with those of the American soldier.

The junior and senior courses offer an in-depth study of individual and group behavior and personnel management. The courses are designed to allow students to develop leadership and planning skills during lab periods. Selected military campaigns and battles will be studied during classes in both years to teach the development of strategy and tactics. During the senior year students will study the importance of ethics and professionalism for the military. Students will be required to develop skills in public speaking, instructional techniques, and written communications.

The department sponsors the local chapter of Scabbard and Blade, the national military honorary society. It also sponsors several other student organizations and numerous activities.

Counterguerrilla Unit. Members of the unit are afforded the opportunity to apply classroom leadership and tactics instruction in a realistic field situation. In addition to weapons and tactics instruction, participation in the unit develops confidence in members' leadership ability, teamwork, and spirit. Membership is open to all Army ROTC students who meet unit and University standards.

Double T Rifle Team. The rifle team is sponsored by the Military Science Department. Members participate in matches held by the Southern Division of the Tri-state Rifle League as well as in several other invitational meets and postal

matches. Persons trying out for the team must be full-time undergraduate students.

Patton Rifles. The Patton Rifles team provides extensive opportunities for members to practice leadership techniques by executing and teaching dismounted drill and other military subjects. The drill team provides color guards at all Texas Tech home football games and for several parades and ceremonies in the Lubbock area. The Patton Rifles team represents Texas Tech in competitive drill meets throughout the Southwest. Membership is open to all Army ROTC cadets who meet drill team and University standards.

Guardian Gold. The Guardian Gold is a social and service organization of Texas Tech women qualified for membership by personal appearance, charm, motivation, and scholastic achievement. The organization provides social activities for the personal development of its members, participates in campus and community service activities, and develops the character of each member through enduring friendship and worthwhile service. Membership is limited. To remain in active status, members must maintain a 2.0 grade-point average.

Red Raider Orienteers. This organization represents Texas Tech at competitive orienteering meets throughout the Southwest. The sport of orienteering requires cross country navigation using map and compass to locate control markers in a race requiring speed, accuracy, and mental decisiveness on the part of the competitor. Membership is open to all students who meet the standards of the organization and the University.

Courses in Military Science. (MILS)

Basic Course

FIRST YEAR

1101. Introduction to Military Subjects (1:1:1). Introduces basic topographic mapreading, fundamentals of land navigation, the sport of orienteering, and elementary rappelling. Also presents weapons safety and marksmanship, aerobics and personal physical fitness programs, survival techniques, and group dynamics.

1102. Introduction to Military Subjects (1:1:1). Provides practical application in group dynamics, survival techniques, rappelling, and emergency first aid. Studies U.S. soldier/equipment, comparison of NATO and Warsaw Pact countries, and the Soviet soldier. Also establishes a personal physical fitness program and presents weapons safety and marksmanship.

SECOND YEAR

2101. A Study of Military Organization and Affairs (1:1:1). Prerequisite: MILS 1101 and 1102 or consent of instructor. Presents the organization and equipment of the Army, marksmanship and safety classes, advanced rappelling techniques, and CPR training. Includes discussions of contemporary military issues. Among the topics previously discussed are the draft, famous military raids, modern battle, and military affairs in Afghanistan, Iran, Libya, and the Germanies.

HIST 3331, 3332. History of United States Military Affairs (3:3:0 each). Prerequisite: MILS 1101, 1102 or equivalent. Student should enroll in HIST 3331 or 3332 concurrently with MILS 2101. HIST 3331 is a chronological survey of American military affairs to 1865. HIST 3332 continues the survey from 1865 to modern times. See History Department section for more details.

2102. Military History and Traditions (1:1:1). Prerequisite: MILS 2101 or equivalent. Examines customs and traditions of the Army. Provides first-aid instruction. Requires student presentations concerning selected campaigns of military history.

Advanced Course

THIRD YEAR

3301. A Study of Senior/Subordinate Relations, Decision Making, and Military Skills (3:3:1). Prerequisite: Lower division Military Science courses or equivalent and consent of department chairperson. Presents the legal and moral basis for the Armed Forces commission. Views styles of leadership. Examines the decision making process and staff relationship. Expands individual proficiency in basic skills. Practices the military application of land navigation in depth. Develops an individual physical readiness program for each student.

3302. Practical Applications of Military Leadership and Planning (3:3:1). Prerequisite: Lower division Military Science course or equivalent and consent of department chairperson. Develops leader behaviors important to the small unit (squad-platoon) leader by tactical exercises. Practices operational planning to include the employment and maintenance of infantry weapons. Surveys selected military campaigns and battles. Continues physical readiness and land navigation instruction.

FOURTH YEAR

4301. Military Leadership and Ethics (3:3:1). Studies military leadership, ethics, and professionalism in depth by seminar, case reviews, and practical applications. Also addresses operational planning and military correspondence techniques.

4302. Professional Military Subjects (3:3:1). Prerequisite: MILS 4301 or equivalent. Studies contemporary subjects of interest to the professional officer including international law concerning war, U.S. military law, and the Army personnel management system. Also views the role of the noncommissioned officer, financial planning, and the professional and social environment of the military installation.

INDIVIDUAL STUDIES

4303. Individual Studies in Military Science (3). Prerequisite: MILS 4302 and consent of instructor. Individualized studies in military topics, leadership management problems, and military policies.

College of Business Administration

Professor Carl H. Stem, *Dean*

Horn Professors Conover and S. Hunt; Professors Amason, Anderson, Austin, Barton, Bellenger, Bowlin, Collins, Darling, Dukes, Freeman, G. Hunt, Koester, Malloy, Mann, Moyer, Peterson, Phillips, Randolph, White, Whitehead, Wilcox, Wilkes, and Yaney; Associate Professors Blair, Bravoco, Burnett, Burns, Chonko, Clancy, Courtney, Dunne, Hein, S. Hora, Howell, Koch, Krefting, Kuzdrall, Luchsinger, Macy, Munter, Ratcliffe, Scott, Sennetti, Upton, and Wade; Assistant Professors Baliga, Chatfield, Ege, Finn, Gately, Green, Harrison, Hatami, Hays, Kasper, Kilchenstein, Kim, Langstraat, Larson, Lyle, McCaslin, Minifie, Moores, Ritchey, Savage, Segrist, Shrader, B. Trotter, R. Trotter, Valencia, Wilson, Wood, and Yadav; Lecturers Bertram, Faver, J. Hora, Sharp, and Volker; Adjunct Associate Professor Payne.

The College of Business Administration offers programs in education for management and administration in business, government, and nonprofit organizations while at the same time advancing knowledge through research, providing community service, and supporting the development of business and industry in Texas, the Southwest, and throughout the nation and foreign countries. Fulfilling these objectives not only creates a stimulating learning environment for the student but also expands the frontiers of knowledge and produces a better prepared faculty.

The college seeks to emphasize the understanding and application of knowledge rather than merely the acquisition of expertise. To this end the college tries to provide the student with an educational experience aimed at developing leadership and understanding of opportunity instead of simply an exposure to knowledge.

Students interested in careers in business and management enter the college's programs with diverse interests and aspirations, and since most look forward to becoming managers, the management function is emphasized. A variety of alternatives for specialization in the functional areas of business and public sector organizations are offered to permit broad job entry level skills.

The College of Business Administration is divided into four functional program areas: Undergraduate Program, Graduate Programs, Research and Special Programs, and the Center for Professional Development. These program areas are supported by faculty organized in research and teaching areas of Accounting, Finance, Information Systems and Quantitative Sciences (including Secretarial Administration), Management, and Marketing.

The baccalaureate and master's programs in business administration and accounting are fully accredited by the American Assembly of Collegiate Schools of Business, the national accrediting organization.

Admissions

Admission of Beginning Freshmen. Students applying for entrance to the College of Business Administration will be accepted if they meet certain requirements. Adequate preparation includes the second year of algebra (Algebra

II) and four units of high school English. The student who has not completed Algebra II in high school must take and complete MATH 1300 in the first enrollment. The student who does not meet the requirements for ENGL 1301 must take and complete ENGL 1300 in the first enrollment. Students must satisfactorily complete (grade of C or better) MATH 1300 and ENGL 1300 in the first enrollment to be eligible for further enrollment in the college.

Transfer Requirements. Students transferring from a junior college must complete at least 60 hours at a senior institution. Students transferring from any institution must have at least a cumulative 2.00 GPA on all transfer credit and at least a 2.00 GPA on their last registration or may be admitted on probation with approval from the Undergraduate Program Office. A student must not be serving a suspension from any institution. Courses which may not be taken pass-fail in residence may not be transferred on a pass-fail basis. Students wishing to transfer into the College of Business Administration are required either to have completed an advanced (nonremedial) college-level mathematics course or to provide a high school transcript to the counselor. See "Transfer Credits from Junior/Community Colleges."

Students transferring from another college at Texas Tech must have at least a 2.00 cumulative GPA at Texas Tech, at least a 2.00 cumulative GPA on work from other institutions, and must bring a transcript to the Undergraduate Program Office prior to the first enrollment in the College of Business Administration to request permission to transfer. Students are limited to one academic transfer into the College of Business Administration unless special approval is secured from the Undergraduate Program Office.

Students will remain in the lower division until they have completed all required freshman and sophomore courses with at least a 2.00 cumulative GPA at Texas Tech.

At least 9 hours of major courses must be taken following the last transfer to the College of Business Administration.

After students have enrolled in the College of Business Administration, all course work taken thereafter at any other institution should receive prior approval from their undergraduate counselor. In no case will transfer credit for ACCT 2300 and/or 2301 be accepted without prior approval after students have enrolled in the College of Business Administration.

Grades of D from another institution will not be accepted in transfer of credits by the College of Business Administration.

Degree Programs

The college offers programs leading to the degrees of Bachelor of Business Administration, Master of Business Administration, Master of Science, Master of Science in Accounting, and Doctor of Business Administration. At the undergraduate level, students may major in Accounting, Economics, Finance, General Business, Management, Management Information Systems, Marketing, Petroleum Land Management, and Secretarial Administration. The college also participates with the School of Law in offering a joint degree program in which the student earns both the Master of Business Administration and Doctor of Jurisprudence

degrees. Details of the master's and doctoral programs may be found in the *Graduate Catalog*.

The Bachelor of Business Administration degree will be awarded to all students who fulfill the following minimum requirements:

1. Satisfactory completion of 122 credit hours (plus two P.E. courses) including general education requirements, lower and upper division core, and major courses.
2. A concentration of major courses in accounting, economics, finance, general business, management, management information systems, marketing, petroleum land management, or secretarial administration.
3. A grade of C or better in ENGL 1301, 1302, MATH 1330, 1331, ECO 2311, 2312, ACCT 2300, 2301, ISQS 2340, 2445, each upper division core course, and each major course.
4. A minimum cumulative 2.00 GPA for all degree program courses attempted (including repeated courses but excluding all freshman activities P.E., M EN 1103, and ROTC).
5. A minimum cumulative 2.00 GPA in all business administration courses.
6. Any course taken following completion of all required course work must be approved by the Undergraduate Program Office before registration.

The B.B.A. degree program is separated into a lower division and an upper division. Students remain in the lower division until they have completed all required freshman and sophomore courses and have at least a 2.00 cumulative GPA for all work at Texas Tech. Lower division students cannot receive degree credit for junior or senior level business administration or economics courses without specific permission. Students who have at least a 2.00 GPA have permission from the Undergraduate Program Office to register for upper division courses while completing all remaining lower division courses.

Lower Division

Students begin business study in the college's lower division, which includes both general education requirements and certain business administration courses.

Courses. (62 semester hours plus two P.E. courses)

General Education Requirements (9 hours of the following courses with asterisks plus P.E. can be taken pass-fail)

B A 1290 — Business Enterprise

ENGL 1301, 1302 — College Rhetoric

MATH 1330, 1331 — Introductory Mathematical Analysis

(Both courses must be completed by the end of a student's third semester following the first registration in the College of Business Administration or the student may not be allowed to reenroll in the college. One or both summer terms at Texas Tech or elsewhere will be considered a semester.)

*HIST 2300, 2301 — History of the U.S.

(Other approved U.S. history course may be selected; only 3 hours of history may be taken credit by exam.)

*Humanities (select one from anthropology, foreign languages, humanities, music literature, philosophy, psychology, art, sociology, or an additional history or English course — except ENGL 1300)

*Lab. Science (choose two from biological sciences, chemistry, geosciences, physics; ANTH 2400 or GEOG 1301, 1101 and/or 1302, 1102. The two do not have to be in the same department, but they must include the appropriate lab taken concurrently.)

*Physical Education freshman activities — 2 semesters (freshman ROTC or M EN 1103 will substitute; hours are not counted for degree)

*POLS 2301 — American Government, Organization

*POLS 2302 — American Public Policy

(Only 3 hours of political science may be taken credit by exam.)

ECO 2311, 2312 — Principles of Economics

*ENGL 2301 or 2302 or 2309 or PHIL 2320

Non-B.A./non-Eco. elective — 3 hours (cannot be of a lower level than courses previously completed in that department nor can it be a physical education activities course, freshman ROTC, or freshman marching band). ENGL 1300 does not count as an elective. Students in the management information systems major should take C S 1362, students in the petroleum land management major should take GEOL 2200, and students in the accounting major should take a psychology course as the lower division elective.

Lower Division Core

ACCT 2300 — Elementary Accounting I

ACCT 2301 — Elementary Accounting II

ISQS 2340 — Introduction to Computers in Business

ISQS 2445 — Introduction to Business Statistics

Students in fields other than secretarial administration should follow the schedule below. Lab. sciences, history, political science, humanities, P.E., and nonbusiness electives may be taken during either the freshman or the sophomore year.

1st Semester	2nd Semester	3rd Semester	4th Semester
B A 1290	MATH 1331	POLS 2301	POLS 2302
MATH 1330	ENGL 1302	Soph. English	Non-B.A./non-Eco.
ENGL 1301	Lab. Science	ECO 2311	elective
Lab. Science	P.E.	ACCT 2300	ECO 2312
P.E.	HIST 2301	ISQS 2340 or 2445	ACCT 2301
HIST 2300	Humanities		ISQS 2340 or 2445

Students in secretarial administration should follow the schedule below. BSA 1337, 2337, and 2338 as well as lab. sciences, history, political science, and P.E. may be taken during either the freshman or the sophomore year. At least a C is required in the business secretarial administration courses.

1st Semester	2nd Semester	3rd Semester	4th Semester
B A 1290	BSA 1337	Soph. English	POLS 2301
MATH 1330	MATH 1331	ECO 2311	ECO 2312
ENGL 1301	ENGL 1302	ACCT 2300	ACCT 2301
Lab. Science	Lab. Science	ISQS 2340 or 2445	ISQS 2340 or 2445
HIST 2300	HIST 2301	BSA 2337	BSA 2338
P.E.	P.E.		

Advancement to Upper Division. To advance to the upper division, a student must complete all lower division courses (except the non-B. A./non-Eco.

elective) with grades of C or better in ENGL 1301, 1302, MATH 1330, 1331, ECO 2311, 2312, ACCT 2300, 2301, and ISQS 2340, 2445, and maintain at least a 2.00 cumulative GPA (including repeated courses) in degree program courses and in all courses attempted at Texas Tech.

No junior or senior level business administration or economics courses can be taken until these requirements are met or unless restricted approval is granted by the Undergraduate Program Office prior to registration. Courses taken ineligibly will not be used to satisfy any part of a degree program.

Students will be granted restricted approval to enroll simultaneously in lower and upper division courses if they register for all eligible remaining lower division courses, have the necessary 2.00 cumulative GPA at Texas Tech, choose upper division courses from the junior year selections, have satisfactorily completed the appropriate prerequisite for each upper division course to be taken, and adhere to the overload policy of no more than 17 hours per semester (16 hours for students on probation) or 7 hours per summer term. Under this restricted approval, the lower division course for which a student is registered cannot be dropped. Also, while under restricted approval a student must complete a lower division course taken by correspondence no later than the date of completion of any upper division course.

Upper Division

Students complete undergraduate degree work in the college's upper division, which includes courses covering upper division core, major courses in a selected field, and elective courses.

Courses.

Upper Division Core (24 hours) in which a grade of C or better is required: FIN 3320, ISQS 3344, MKT 3350, MGT 3370, 3373, 4380, BLAW 3391, ECO 3311

Major Courses

Choose from fields of study in accounting, economics, finance, general business, management, management information systems, marketing, petroleum land management, or secretarial administration. Any substitutions must be approved in writing by the Undergraduate Program Office and the faculty advisor. No major courses may be taken by pass-fail, credit-by-examination, or correspondence and all must have a grade of at least C. Major courses are marked with an asterisk (*) to distinguish them from core courses.

Electives

Sufficient to complete 122 semester hours (plus two P.E. courses). No electives can be of a lower level than courses previously completed in that department nor can they be a physical education activities course, freshman ROTC, or freshman marching band. Some courses may have to be non-B.A./non-Eco. to meet accrediting requirements. ENGL 1300 cannot be used as an elective in a business administration degree program.

Accounting Major. (24 semester hours)

The primary objective of the undergraduate accounting program is to prepare students for professional accounting positions at the entry level in public accounting, government, industry, and other organizations in the public and private sectors. Thus, the focus of the program is on high quality and thorough professional education in accounting, including preparation of students to take and successfully complete professional certification examinations, e.g., the CPA and CMA examinations. A minimum 2.60 cumulative GPA is required in ACCT 2300, 2301, and 3304 for students desiring to declare an accounting major or to take selected junior and senior accounting courses. A psychology course must be taken to satisfy one of the non-B.A./non-Eco. electives. This course is in addition to the lower division humanitites requirement.

5th Semester	6th Semester	7th Semester	8th Semester
*ACCT 3304	*ACCT 3305	*ACCT 4300	*Sr. Acct. courses — 6 hrs.
ISQS 3344	*ACCT 3306	*ACCT 4301	MGT 4380
MKT 3350	MGT 3370	FIN 3320	†Electives — 6 hrs. or enough
MGT 3373	BLAW 3391	PSY 1300	to complete 122 hrs.
ECO 3311	†Elective — 3 hrs.	*Sr. Acct. course — 3 hrs.	

Senior accounting courses include ACCT 4302, 4303, 4304, 4305, 4307, 4308, 4309, 4310.

†No more than 6 hours of electives may be senior accounting courses.

Economics Major. (30 semester hours)

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320	ISQS 3344	*ECO 4323	*Group C — 9 hrs.
MKT 3350	MGT 3370	*Group A — 3 hrs.	MGT 4380
BLAW 3391	MGT 3373	*Group B — 6 hrs.	Elective — 3 hrs. or enough
ECO 3311	*ECO 3312	Non-B.A./non-Eco.	to complete 122 hrs.
*Group A — 3 hrs.	*ECO 3323 or FIN 3323	elect. — 3 hrs.	

Group A — ECO 3313, 3320, 3324, 3326, 4322, 4332 (or FIN 4328), FIN 4323.

Group B — ECO 3322, 3333, 4300, 4331, 4333, 4334, MGT 4372, remaining Group A courses. Group C — any upper-level business administration courses not used elsewhere, remaining Group A or B courses.

Finance Major. (30 semester hours)

The goal of the undergraduate program in finance is to enhance leadership potential by providing a high quality and thorough educational experience in preparation for careers in banking, business finance, investment management, real estate, and insurance.

Students may specialize either in financial management or in real estate. Within the financial management specialization students may take elective courses in the financial institutions, investments, corporate finance, insurance, real estate, or international finance area. It is recommended strongly that students have a 2.60 GPA in ACCT 2300, 2301, ISQS 2445, FIN

3320, and ECO 2312 before declaring financial management or real estate as a specialization.

5th Semester	6th Semester	7th Semester	8th Semester
*FIN 3323	MGT 3370	*FIN 4324	*FIN 4329
*ACCT 3301	MGT 3373	*ECO 3320	*FIN 4330
MKT 3350	ISQS 3344	*Group A — 6 hrs.	MGT 4380
BLAW 3391	*ACCT 3304	Non-B.A./non-Eco.	*Group A — 3 hrs.
FIN 3320	ECO 3311	elect. — 3 hrs.	Elective — 3 hrs. or enough to complete 122 hrs.

Group A — FIN 3327, 3332, 3334, 4323, 4325, 4326, 4328, 4333, 4335, 4336. Group B — ACCT 3305, 3306, 4300, 4305, 4310, ISQS 3348, ECO 3303, 3324, 3326, 3330, 4323.

Finance Major — Real Estate Specialization. (30 semester hours)

5th Semester	6th Semester	7th Semester	8th Semester
*FIN 3323	MGT 3373	*ECO 3320	MGT 4380
*ACCT 3301	MGT 3370	*FIN 4324	*FIN 4329
MKT 3350	ECO 3311	*Group A — 6 hrs.	*FIN 4330
FIN 3320	*ACCT 3304	Non-B.A./non-Eco.	*Group A — 3 hrs.
BLAW 3391	ISQS 3344	elect. — 3 hrs.	Elective — 3 hrs. or enough to complete 122 hrs.

Group A — FIN 3332, 3334, 4333, 4335, 4336.

General Business Major. (30 semester hours)

5th Semester	6th Semester	7th Semester	8th Semester
*Advanced course — 3 hrs.	*Advanced courses — 6 hrs.	*Advanced courses — 9 hrs.	*Advanced courses — 12 hrs.
MGT 3370	FIN 3320	Elective — 3 hrs. or	MGT 4380
MGT 3373	MKT 3350	enough to complete	
ECO 3311	BLAW 3391	122 hours	
ISQS 3344		Non-B.A./non-Eco.	
		elect. — 3 hrs.	

Advanced courses — 6 hours each from four of the following five areas:

Accounting — ACCT 3301, 3304, 3305, 3306, 4300, 4301, 4302, 4303, 4304, 4305, 4307, 4308, 4309, 4310

Finance — FIN 3323, 3327, 3332, 3334, 4323, 4324, 4325, 4326, 4328, 4329, 4330, 4333, 4335, 4336

ISQS — ISQS 3343, 3345, 3346, 3348, 4343, 4344, 4345, 4347, 4348

Management — MGT 3374, 3376, 3379, 3396, 4370, 4371, 4372, 4373, 4374, 4375, 4397

Marketing — MKT 3352, 3353, 3356, 4351, 4354, 4355, 4356, 4358, 4359

Two additional courses from any of the above or other upper level courses.

Management Major. (30 semester hours)

Students may group available courses to emphasize personnel/organizational behavior, general management, or production/operations management. Course recommendations are available in the Undergradu-

ate Program Office. Although not required, it is strongly suggested that all management majors take MGT 3374 and 3379. An example of a program for a student wishing to emphasize personnel/organizational behavior would include the courses below.

5th Semester	6th Semester	7th Semester	8th Semester
MGT 3370	MGT 3373	*Group A — 9 hrs.	MGT 4380
*MGT 3376	FIN 3320	*Group B —3 hrs.	*Group A — 3 hrs.
ECO 3311	MKT 3350	Junior/senior-level	*MGT 4397
BLAW 3391	*MGT 3374	B.A. course — 3 hrs.	*Group B — 3 hrs.
ISQS 3344	*MGT 3379		Non-B.A./non-Eco. elective — 3 hrs. or enough to complete 122 hrs.

Group A — ISQS 3343, 3345, 4343, MGT 3374, 3379, 3396, 4370, 4371, 4372, 4373, 4374, 4375. Group B — junior-senior level business administration or economics courses or courses approved by a faculty advisor.

Management Information Systems Major. (30 semester hours)

The management information systems program prepares students to solve business problems and to make management decisions using the computer. Typically, graduates begin their careers as computer programmers/analysts or as business systems analysts. A minimum 2.60 cumulative GPA is required in MATH 1330, 1331, ECO 2311, 2312, ACCT 2300, 2301, ISQS 2340, and 2445 for majors in this field.

*C S 1362 should be taken in lower division.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320	ISQS 3344	MGT 3370	MGT 4380
MKT 3350	MGT 3373	ECO 3311	*Group B — 6 hrs.
BLAW 3391	*ISQS 3346	*ISQS 3348	Electives — 6 hrs. or
*ISQS 2341	*Group A — 3 hrs.	*ISQS 4348	enough to complete
*ISQS 3343	Elective — 3 hrs.	*Group A — 3 hrs.	122 hrs.

Group A — C S 1363, 2351, 3350, 3361, 4391, I E 3302, 3307. Group B — any course from Group A not previously used elsewhere; ACCT 3301, 3304, 3306, 4305, ISQS 4343, 4347, B A 4382, C S 4353, 4354, other upper-level courses as approved by a faculty advisor.

Marketing Major. (30 semester hours)

The goal of the undergraduate program in marketing is to enhance leadership potential by providing a high quality and thorough educational experience in preparation for careers in marketing. Students must take six required major marketing courses. Four elective courses fill out the requirements and allow the breadth or depth in marketing and related subject areas.

5th Semester	6th Semester	7th Semester	8th Semester
MKT 3350	*MKT 3352	*MKT 4354	*Group A — 9 hrs.
FIN 3320	MGT 3373	Non-B.A./non-Eco. elect. — 3 hrs.	MGT 4380
MGT 3370	*MKT 3356	ECO 3311	Elective — 3 hrs. or enough to complete 122 hrs.
BLAW 3391	*MKT 3353	*MKT 4351	
ISQS 3344	*Group A —3 hrs.	*MKT 4359	

Group A — MKT 4356, 4358, 4360, 4361, 3000/4000-level courses in other areas of the college, ADV 3310, 3311, 3351, 3361, 4312, 4316, PSY 1300, SOC 2301, ECO 3320, GEOG 3337, C&T 4390, 4391. (If business administration courses are chosen, the following are recommended: ACCT 3301, 3306, ISQS 3343, MGT 3374, 4370, 4373, BLAW 3392.)

Petroleum Land Management Major. (39 semester hours)

The goal of the undergraduate program in petroleum land management is to enhance leadership potential by providing a high quality and thorough educational experience in preparation for a career as a petroleum landman. A petroleum landman is involved in obtaining the legal rights to explore for and produce natural resources and has a responsibility for managing and maintaining these mineral rights.

*GEOL 2200 should be taken in lower division.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320	ISQS 3344	MGT 3373	MGT 4380
MKT 3350	*GEOL 3304	ECO 3311	*BLAW 3395
MGT 3370	*ACCT 4300	*GEOL 4323	*FIN 4330
BLAW 3391	*BLAW 3392	*ACCT 4310	*AECO 4303 or GEOL 4324 or PALA 4303
*GEOG 3300	*MGT 3376	*BLAW 3393	*Approved major course — 3 hrs.
			Elective — enough to complete 122 hrs.

Secretarial Administration Major. (30 semester hours)

The secretarial administration program is designed to prepare its graduates for professional secretarial/administrative office careers and for the Certified Professional Secretary (CPS) examination. Students desiring to take junior and senior secretarial administration courses and students desiring a degree program in secretarial administration must have at least a C in BSA 1337, 2337, and 2338. Because the recommended 5th semester includes both lower division and upper division courses, students must obtain approval from the Undergraduate Program Office before registering. The procedure is detailed under "Advancement to Upper Division." Non-B.A./non-Eco. electives should be junior or senior level or be approved by the faculty advisor.

5th Semester	6th Semester	7th Semester	8th Semester
POLS 2302	MGT 3373	Non-B.A./non-Eco. elect. — 3 hrs.	Non-B.A./non-Eco. elect. — 3 hrs.
PSY 1300	ECO 3311	ISQS 3344	MGT 4380
FIN 3320	*BSA 3338	*BSA 4337	*BSA 4339
MGT 3370	MKT 3350	*BSA 4338	*BSA 4340
*BSA 3337	BLAW 3391	*BLAW 3392	Elective — 3 hrs or enough to complete 122 hrs.

Prelaw Studies. Schools of law do not normally prescribe specific courses as part of their admission requirements. Students interested in attending law school after graduation may pursue any of the regular programs offered by the college.

18-Hour Nonbusiness Minor for B.A. Students. Students who wish to minor in an area from another college at Texas Tech may replace the electives in their degree program with 18 hours of courses from another college. General business students may combine two courses of nonbusiness advanced study from the major with four elective courses for the 18 hours. This may result in hours being added to the program.

None of the 18 hours may be taken pass-fail or by correspondence. A grade of C or better is required in each course. At least 12 hours must be above the sophomore level. Required courses used in the lower division, core, or major cannot count in a minor except for general business as described above.

18-Hour Minor for Non-B.A. Students. The requirements for an 18-hour minor for students in colleges other than Business Administration are 18-hour general business program:

12 hours of junior/senior-level courses chosen from at least three separate professional fields — accounting, finance, information systems and quantitative sciences, management, marketing, secretarial administration.

Additional 6 hours of either junior/senior-level or lower division courses chosen from the following: ACCT 2300 (or 2303 or 2304), 2301, FIN 2320, ISQS 2340, 2341, 2445, BSA 1337, 2337, 2338.

None of the 18 hours may be taken pass-fail. A grade of C or better is required in each course, subject to approval by the major college. All prerequisites must be completed before enrollment in a course.

18-hour minor in professional field:

12 hours of junior/senior-level courses to be taken in one professional field (accounting, finance, management, management information systems, marketing, secretarial administration). Additional 6 hours of upper division courses chosen from any of the following areas — accounting, finance, information systems and quantitative sciences, management, marketing, policy and environment, secretarial administration — or lower division courses chosen from ACCT 2300 (or 2303 or 2304), 2301, FIN 2320, ISQS 2340, 2341, 2445, BSA 1337, 2337, 2338. For a minor in selected professional fields, a structured program is required.

None of the 18 hours may be taken pass-fail. A grade of C or better is required in each course, subject to approval by the major college. All prerequisites must be completed before enrollment in a course.

Students in other colleges of the University may schedule business secretarial administration courses into their degree programs as allowed by their academic departments. For example, the colleges of Home Economics and Arts and Sciences offer students the opportunity to minor in secretarial administration. Students should consult with their major advisors.

Nondegree Students. Nondegree status may be obtained for anyone wishing to take an upper division course for personal reasons without completing lower division requirements. A nondegree form must be signed in the Undergraduate Program Office before registration. The nondegree status will continue until a written request for a change has been approved by the Undergraduate Associate Dean. All prerequisites and academic regulations based on grade-point average — such as probation and suspension — apply to nondegree students. Courses taken while in the nondegree status may not be used as part of a degree program.

Regulations

Catalog Selection. Students will use the catalog issued for the year in which they first enrolled in the College of Business Administration or a later catalog as approved. However, if they later change their degree program by transferring to another institution or another college at Texas Tech they will use the catalog in effect when they are readmitted to the College of Business Administration. Only with the specific approval of the Undergraduate Program Office may a different catalog be selected and students must enroll in the college at least once before graduation following a change of catalog. In no case may a catalog more than seven years old be used.

Course Load. The normal course load for a semester is 15 to 16 credit hours, and students are expected to spend approximately two hours preparing for each hour of lecture. Employment should be considered when determining the course load for each semester. The maximum load for a semester is 17 hours and the maximum for a summer term is 7 hours except that a student with a 3.00 cumulative GPA at Texas Tech may take 18 hours in a long semester without permission. Students must request permission in the Undergraduate Program Office at least two weeks before registration to take an overload. Students on probation may not take more than 16 hours each semester. Correspondence courses are included in a student's course load; therefore, hours taken in residence may have to be reduced to avoid an overload.

Course Substitution. The body that imposes a course requirement has the authority to substitute for it; e.g., the college or its faculty for lower division and core courses and the academic area for major courses.

Course Prerequisites. Prerequisites are established by the faculty to guide students in their programs. Failure to observe prerequisites may result in a student's academic standing being lowered. The faculty enforces prerequisites as eligibility for remaining in a course. Prerequisites are governed by the catalog in effect when the course is taken.

In addition to the prerequisites noted for each course in the course listing, the following also apply for each of these accounting courses: ACCT 3305, 3306, 4301, 4302, 4303, 4304, 4307, 4308, and 4309:

1. A minimum 2.00 cumulative GPA is required on all Texas Tech course work.
2. A minimum 2.60 cumulative GPA is required in ACCT 2300, 2301, and 3304. A maximum of 15 attempted accounting hours in ACCT 2300, 2301, and 3304 will be allowed to attain the required 2.60 GPA. None of the courses may be completed more than twice, and if a grade of A or B has been received in ACCT 2300 and 2301, that course may not be repeated. Only one W will be allowed in each course. Additional Ws will be treated as Fs in determining the 2.60 GPA requirement. Actual letter grades for courses taken at another institution are used in determining the 2.60 GPA. This paragraph also applies to transfer credit.
3. ACCT 3304 must be completed with at least a grade of C.

The following prerequisite applies to ISQS 3346, 3348, 4348, and 4382 — a minimum 2.60 cumulative GPA is required in MATH 1330, 1331, ECO 2311, 2312, ACCT 2300, 2301, ISQS 2340, 2445. For transfer students, the actual letter grades are used to determine the 2.60 GPA.

A grade of C or better in MKT 3350 is a prerequisite for all other marketing courses.

General Standards and Requirements. Minimum standards and requirements of the College of Business Administration are generally the same as those for the University as a whole (see Academic Information section of this catalog). However, additional requirements are noted below.

Probation and Suspension. The policy regarding academic suspension and probation for students enrolled in the College of Business Administration is the same as that for the University in general.

Correspondence Courses. No major or minor course may be taken by correspondence. Correspondence credit in a lower division course must be completed no later than the date of completion of any upper division course taken while on restricted approval. A student may not register for or complete a correspondence course during the last semester or summer term before graduation. At least 3 hours must be passed in residence after completion of a correspondence course to be used in a degree program.

Credit by Examination. Students enrolled in the College of Business Administration must have written permission from their undergraduate counselor before attempting credit by examination. To be eligible to attempt credit by examination for a course, a student must not have audited the course or must not have completed a more advanced course in the same subject. A student must not have been enrolled more than 12 days before taking a CLEP test or more than 3 days before taking a departmental test. Credit by examination may fulfill graduation requirements but will not apply to the minimum residence requirement of 30 hours.

Grade-Point Deficiency. A grade-point deficiency may be eliminated only by repeating program courses or by taking additional major courses unless otherwise approved by the Undergraduate Program Office.

Grades. No change of grade will be accepted later than one semester following the assignment of the grade. An X (no grade reported) will become an F at the end of the next grade period.

Pass-Fail. A maximum of 13 hours (not including B A 1290) may be taken pass-fail. A course which is a prerequisite for a required core or professional

course may not be taken pass-fail. Up to 9 hours of lower division courses may be chosen from U.S. history, humanities, lab. science, political science, or sophomore English and the remaining pass-fail courses may be chosen from P.E. and free electives. Pass-fail may not be declared on any course that could be used in the major area of the student's degree program unless all major courses have been completed at the time of declaration. No course in a student's major area may be taken pass-fail (i.e., accounting course for an accounting major) even if major courses have been completed. If a course is taken pass-fail which is ineligible according to college policy to be so taken at the time of enrollment, it must be replaced by the next higher course. Pass-fail hours are excluded in determining eligibility for the Dean's Honor List.

Repeated Courses. No course in which a grade of C or better is earned may be repeated for degree credit or grade points unless approved by the Undergraduate Program Office prior to repeat enrollment.

A student must have at least a 2.00 cumulative GPA to be eligible to seek permission to repeat a course more than once in which a grade of D or F is earned. Repeating a course does not remove a prior grade.

Accreditation. The American Assembly of Collegiate Schools of Business prescribes that no less than 40 percent of the total hours required for graduation be in subjects other than business. Compliance with the degree plans outlined on the preceding pages will result in at least 40 percent nonbusiness courses in each program.

Application for Degree. As soon as the student qualifies for a degree program (at least one year before the proposed graduation date), application for the degree must be made through the Undergraduate Program Office. Upon receipt of the degree application, an audit of the student's records is made by the Undergraduate Program Office to verify eligibility for the proposed graduation. Avoidance of errors is the main purpose of the application, but the student is expected to remember that graduation is attained by fulfilling the requirements for a particular program in the catalog under which he or she is entitled to graduate and to register in accordance with those requirements. It remains the responsibility of the student to fulfill all catalog requirements.

Diploma Fee. An $8 diploma fee must be paid to the Cashier and a copy of the receipt brought to the Undergraduate Program Office at the time the degree application is submitted.

Ineligible Registration. The college may drop any ineligibly registered student from a course for reasons such as unapproved overloads, unapproved repeated courses, lower division/upper division rule infractions, excessive absences, and lack of prerequisites. Courses taken ineligibly may not be used in the student's degree program.

Transfer Credit from Junior/Community Colleges. Undergraduate programs in business administration in universities normally concentrate the professional courses in the last two years of a four-year program. Only a limited amount of work in business is offered below the junior year. The objective of this policy is to permit the student to acquire a foundation of work in the basic arts and sciences as a prerequisite for professional courses in business.

Students planning to take their first two years of work at a junior/community college or at another four-year college should take only those courses in business that are offered as freshman or sophomore courses at Texas Tech. These lower division courses are numbered 1000-2000.

Professional business courses which are taught in the junior or senior year at Texas Tech may not be completed at a two-year college for transfer credit in the business core or professional courses (unless validated by the College of Business Administration). Courses taught as remedial, vocational, or career classes at the junior/community colleges will not be accepted for credit toward a bachelor's degree. See also "Transfer Requirements."

Services

Counseling. Lower division students are guided by counselors in the Undergraduate Program Office, and students are encouraged to visit with faculty advisors before deciding on a major. The freshman course "Business Enterprise" should help students in career planning, and aptitude tests are available in the University Counseling Center.

Upper division students should maintain contact with a counselor in the Undergraduate Program Office concerning degree requirements and with faculty advisors for help in selecting courses to achieve career objectives.

Furr Computer Learning Center. The Roy Furr Memorial Computer Learning Center, equipped with a minicomputer supporting 32 terminals and 30 megabytes of on-line mass storage in a time sharing environment, is an integral part of the college's learning program. Remote job entry to and interaction with the University's central computer provides the student with the latest in computer technology and enables the college to give every student exposure to the computer and its role in the modern business or public-sector organization.

Learning Resources. The college's learning programs are supported by a variety of audio-visual resources, including TV filming and viewing facilities, a modern behavioral lab which enhances the effectiveness of student learning experiences, and the full resources of the University library.

Courses

Courses listed may be substituted by equivalent courses from another college or university.

Courses numbered below 3000 are lower division courses; those numbered 3000 and 4000 are upper division courses. In order to enroll in upper division courses, business administration students must be in the upper division of the college. Non-business administration students must have at least a 2.00 cumulative GPA and at least 60 hours or written permission of the Undergraduate Program Office.

Courses taken ineligibly before transfer into the college will be used only as electives in the student's degree program in the College of Business Administration.

Courses in Business Administration. (B A)

1290. Business Enterprise (2:2:0). The study of business as a profession, a function, and an institution. Automatically taken pass/fail but not part of the 13-hour pass/fail limit.

4381. Individual Problems in Business Administration (3). Prerequisite: Senior standing. 3.00 GPA in major, 2.75 cumulative GPA, and written consent of supervising instructor prior to registration. Independent problem research under guidance of a faculty member. Student should register for section appropriate to the academic area in which the work will be done.

4382. Internship in Business Administration (3). Prerequisite: At least 6 hours of professional courses (excluding core courses) to be determined by the area faculty; other minimum standards determined by area; written approval form contains specific requirements for participation. This course permits students to enhance their knowledge within their field of specialization through application of concepts, principles, and techniques learned in the classroom. A maximum of 3 hours may be earned by internships toward a degree program.

4383. Special Topics in Business (3:3:0). Prerequisite: Determined by area. Examination of specialized problems including such varied topics as working capital management, commodity and financial futures investment, and small business finance. May be repeated once for credit with no duplication of topic.

Courses in Accounting. (ACCT)

2300. Elementary Accounting I (3:3:1). Prerequisite: At least a C in MATH 1330, 1331, and sophomore standing. Accounting for merchandise operations, proprietorships, negotiable instruments, specialized books of original entry, and the voucher system. Credit will not be given for ACCT 2303 or ACCT 2304 and 2300.

2301. Elementary Accounting II (3:3:1). Prerequisite: ACCT 2300. Second course in elementary accounting. Partnerships, corporations, cost accounting, assets, theory, principles of accounting, and interpretation of financial statements.

2303. Using Accounting Information (3:3:0). Prerequisite: Sophomore standing. A survey of basic accounting concepts including reporting and interpreting financial data, emphasizing the uses of accounting in planning and controlling personal and business activities. Nonbusiness majors only. Credit not granted for both ACCT 2303 and 2300. May substitute for ACCT 2300 with approval of area faculty.

2304. Industrial Accounting for Engineers (3:3:0). Prerequisite: Sophomore standing. A basic accounting course combining a managerial approach to financial accounting with a highly condensed presentation of the principles and procedures of accounting. Credit not granted for both ACCT 2304 and 2300.

3301. Accounting for Managerial Planning and Control (3:3:0). Prerequisite: ACCT 2301 and nonaccounting major. Accounting information as an aid to management decision making.

3304. Intermediate Accounting I (3:3:1). Prerequisite: ACCT 2301. Review of elementary accounting, net income concepts, corporations, current assets, and investments.

3305. Intermediate Accounting II (3:3:1). Prerequisite: ACCT 3304. Fixed assets, liabilities and reserves, interpretation and analysis of financial statements, application of funds, cash flow statement, reorganizations, and price level impact on financial statements.

3306. Principles of Cost/Managerial Accounting (3:3:1). Prerequisite: ACCT 3304 and ISQS 2445. A study of principles and techniques of cost/managerial accounting for product costing, planning, control, and decision making.

4300. Income Tax Accounting (3:3:0). Prerequisite: ACCT 2300. A study in detail of certain provisions of the Internal Revenue Code, combined with elementary tax planning in business and individual transactions.

4301. Principles of Auditing (3:3:0). Prerequisite: ACCT 3305. A study of system-based independent audits including auditing objectives, procedures, internal control, working papers, and reporting on the fairness of financial statements.

4302. Public Sector Accounting (3:3:0). Prerequisite: ACCT 3304. Application of accounting principles to selected governmental and not-for-profit organizations including state and local governments, universities, hospitals, and other public sector entities.

4303. Advanced Accounting Theory (3:3:0). Prerequisite: MATH 1331 and ACCT 3305. Partnerships, ventures, installment sales, consignments, bankruptcies, and receiverships, estates and trusts, and actuarial science.

4304. Advanced Accounting Problems (3:3:0). Prerequisite: ACCT 3305. Home office and branch accounting, consolidations, governmental units, and insurance.

4305. Accounting Systems (3:3:0). Prerequisite: ACCT 2301. The theories, procedures, and techniques of designing information systems for organizations that maintain financial records.

4307. Advanced Income Tax Accounting (3:3:0). Prerequisite: ACCT 3304 and 4300. Methodology in income tax research and planning. Case studies used for corporate and individual problem solutions.

4308. Advanced Auditing (3:3:0). Prerequisite: ACCT 4301. Readings in auditing. Review of auditing standards; case studies in auditing procedures and reporting.

4309. Advanced Cost/Managerial Accounting (3:3:0). Prerequisite: ACCT 3306. A study of advanced cost/managerial topics and an overview of contemporary issues in management accounting.

4310. Petroleum Accounting (3:3:0). Prerequisite: ACCT 2301. Accounting for the production, refining, and distribution of oil and gas with emphasis upon production.

Courses in Finance. (FIN)

2320. Personal Financial Planning and Investing (3:3:0). Prerequisite: Nonfinance majors only. Emphasis on elements that should be considered before investing in real estate, insurance, personal property, and securities. Introduction to the operation of securities markets.

3320. Corporation Finance I (3:3:0). Prerequisite: ECO 2311, 2312, ACCT 2300, 2301, and ISQS 2445. An introductory survey of corporation finance covering financial mathematics, capital budgeting, sources of funds, and financial analysis. Detailed analysis of the working capital decision.

3323. Principles of Money, Banking, and Credit (3:3:0). Prerequisite: ECO 2311 and 2312 or concurrent with ECO 2312. A basic course, including consideration of monetary standards, organization and functioning of the commercial banking system and the Federal Reserve System, problems of money, prices, and credit control. Recent monetary and banking trends are emphasized. (ECO 3323)

3327. Life and Health Insurance (3:3:0). The nature of life insurance, various ways of utilizing the protection it offers. Principle features of insurance and annuity contracts. Group insurance, industrial insurance, disability protection, insurance company investments, and the taxation of policy proceeds.

3332. Real Estate Fundamentals (3:3:0). Prerequisite: FIN 3320 or equivalent. Introduction to property law, finance, valuation, investment analysis and brokerage. Operations of the real estate market and the study of urban land use including urban growth, city structure, and land use planning.

3334. Real Estate Finance (3:3:0). Prerequisite: FIN 3320 or equivalent. Mechanisms of real estate financing, sources of funds and financial institutions, governmental agencies. Financial instruments available to the investor, mortgage risk analysis, and loan principles.

4323. Management of Financial Institutions (3:3:0). Prerequisite: FIN 3320, 3323, and ACCT 3304. Operation and management policies of depository financial institutions. Commercial bank management is stressed. Examines internal operation, regulation, and supervision of institutions studied. Problems and cases.

4324. Investments (3:3:0). Prerequisite: FIN 3320. Overview of various investment media and markets associated with them. Emphasis on fundamental and technical analysis, sources of information, and the efficient markets concept.

4325. Principles of Portfolio Management (3:3:0). Prerequisite: FIN 4324 and ACCT 3304. Advanced study of selecting and combining securities into a portfolio. Includes setting investment goals, diversification and risk reduction, capital market theory, and portfolio selection models.

4326. Property and Casualty Insurance (3:3:0). Basic study in coverages offered by property and casualty insurers. Emphasis will be on development, basic concepts, and legal basis of the various lines of property and casualty insurance.

4328. International Finance (3:3:0). Prerequisite: FIN 3323 or equivalent experience. A study of the international monetary system in its theoretical and institutional setting. The flows of financial claims between countries both on current and capital account, and the function of the foreign exchange market in arbitrage and hedging. The position of an individual business firm in conducting international trade, the procedures and practices in financing international transactions. (ECO 4332)

4329. Money and Capital Markets (3:3:0). Prerequisite: FIN 3320 and 3323. Determinants of savings and investments, interest rates, flow of funds, portfolio selection, and security pricing. Studies of various money and capital markets. Government impacts on markets.

4330. Corporation Finance II (3:3:0). Prerequisite: FIN 3320 and ACCT 3304. Advanced study of corporation finance topics including capital budgeting, risk, cost of capital, capital structure, dividend policy, mergers, business failure. Cases may be used.

4333. Real Estate Appraisal (3:3:0). Prerequisite: FIN 3334 or equivalent. Appraisal and valuation techniques applied to residential, commercial, and industrial property.

4335. Real Estate Investment Analysis (3:3:0). Prerequisite: B A 3334. The framework for urban real estate investment decisions by individuals and institutions. Exposition of rate-of-return analysis and discounted cash flow calculations through computer simulation. Use of financing techniques, leverage, risk analysis and control, and taxation.

4336. Urban Land Development (3:3:0). The land conversion process including feasibility analysis, market and merchandising targets, site selection, design, construction, and financial analysis. Land use controls, planning, and environmental constraints.

Courses in Information Systems and Quantitative Sciences. (ISQS)

2340. Introduction to Computers in Business (3:3:0). Prerequisite: At least a C in MATH 1330 and 1331. This course surveys computer principles, procedures, concepts, hardware, software, information systems, business organizational computer considerations and implications, BASIC programming, and library programs.

2341. Business Computer Programming (3:3:0). Prerequisite: ISQS 2340 and C S 1362. This course introduces the student to COBOL. The student is expected to demonstrate a basic competency in using the language to solve several problem situations.

2445. Introduction to Business Statistics (4:3:2). Prerequisite: At least a C in MATH 1330 and 1331. Techniques of analysis of numerical data including averages, dispersion, statistical inference, linear correlation, and time series. Use of the IDA statistical computer package.

3343. Management Science and Operations Research I (3:3:0). Prerequisite: ISQS 2445. Development and understanding of business decision tools and models to be applied to the managerial decision process.

3344. Introduction to Production/Operations Management (3:3:0). Prerequisite: ISQS 2340 and 2445. An overview of the production/operations function in organizations with examples of the application of computer and quantitative skills to management problems. Both design and operating problems are discussed.

3345. Logistics Systems Management (3:3:0). Prerequisite: MGT 3370. An introduction to logistics as a systems approach to ensuring that goods, services, and personnel are where they are needed, when they are needed. Interaction of the functional areas within the organization in the attempt to produce and deliver the output of the organization.

3346. Advanced Application Programming Techniques (3:3:0). Prerequisite: C S 1362 and ISQS 2341. Application of data structures in solving business problems. Students are required to work on projects involving writing of large programs using appropriate data structures and techniques.

3348. Database Management Systems (3:3:0). Prerequisite: ISQS 3346. Basic concepts of database management systems, recent developments in the area of database systems. Students develop a prototype database application of their own.

4343. Management Science and Operations Research II (3:3:0). Prerequisite: ISQS 3343. The application of advanced quantitative tools to business problems.

4344. Production/Operations Management I (3:3:0). Prerequisite: ISQS 2340, 2445, and 3344. Critical examination of management decision-making techniques, with major emphasis on the practical applications of quantitative methods to analysis of the production/operations function.

4345. Production/Operations Management II (3:3:0). Prerequisite: ISQS 2340, 2445, and 3344. An extension of Production/Operations Management I, with a rigorous application of quantitative analysis problems of systems designed and resource allocation within the organization.

4347. Advanced Business Statistics (3:3:0). Prerequisite: ISQS 2445. A more extended study of business statistics, including multiple and partial correlation, analysis of variance, and chi-square tests. Heavy use of SAS and other statistical computer packages.

4348. Systems and Procedures (3:3:0). Prerequisite: ISQS 3346. An extensive study of the analysis, design, and implementation of management information systems including the associated technical, behavioral, and operational problems.

Courses in Management. (MGT)

3370. Organization and Management (3:3:0). The management function; basic principles, concepts, and practices in the operation of the organization.

3373. Managerial Communication (3:3:0). Prerequisite: At least a C in ENGL 1301 and 1302. The application of communication principles to managerial situations; an overview, simulation, and analysis of the communication process as related to the business environment.

3374. Personnel Administration (3:3:0). Principles and methodology in general personnel management and work force maintenance.

3376. Behavioral Science in Business and Industry (3:3:0). Theory, methods, and demonstrations of behavioral science applied to problems of business, industrial, and engineering setting.

3379. Advanced Organization and Management (3:3:0). Prerequisite: MGT 3370. The design and management of organizations in considerable depth beyond the basic course.

3396. Recent Labor Legislation (3:3:0). Prerequisite: MGT 3370. Study of permissive areas of activity in labor relations, with particular emphasis on major federal laws. General state labor legislation with emphasis on Texas laws is included.

4370. Management of Small Business Enterprise (3:3:0). Prerequisite: MGT 3370. A problem course involving the application of principles of management to small-scale enterprise situations.

4371. Job Evaluation and Wage Administration (3:3:0). Applications of wage theory to wage problems of the firm, investigation of financial incentives, and administration of the wage program.

4372. Labor Relations (3:3:0). A study of labor union development, organization, leadership, and operational techniques. Consideration of collective bargaining issues and procedures.

4373. Organizational Behavior (3:3:0). Prerequisite: MGT 3376. Concepts and tools designed to increase the understanding of human behavior and managerial practices with emphasis on organizational contexts.

4374. Advanced Personnel Administration (3:3:0). Prerequisite: MGT 3374. Problems in personnel management examined through consideration of cases, experiences, and results of research in various fields of employer-employee relationships.

4375. International Management (3:3:0). Prerequisite: MGT 3370 or ECO 3333. Exploration of organization and management issues in international enterprise.

4380. Administrative Policy (3:3:0). Prerequisite: Senior standing and all core courses (ECO 2311, 2312, 3311, ACCT 2300, 2301, ISQS 2340, 2445, 3344, FIN 3320, MKT 3350, MGT 3370, 3373, and BLAW 3391). Problems of policy formulation in the administration of the firm.

4397. Management and the Business Environment (3:3:0). Study and cases in social responsibility, business ethics, and other problems in the external environment of the business organization.

Courses in Marketing. (MKT)

3350. Introduction to Marketing (3:3:0). Prerequisite: ECO 2312 (AECO 2305 or ECO 2305 for nonbusiness majors). Marketing structures and agencies. Motives and buying habits. Types of middlemen, marketing institutions, and channels. Current marketing practices. Marketing of industrial and consumer goods.

3352. Buyer Behavior (3:3:0). Prerequisite: MKT 3350. The buyer as a problem solver; buying decision processes; factors influencing behavior; principles, theories, and models; behavioral research techniques.

3353. Marketing Channels and Distribution Systems (3:3:0). Prerequisite: MKT 3350. An analysis of policies, decisions, and planning related to distribution channels for consumer and industrial goods.

3356. Marketing Research and Analysis (3:3:0). Prerequisite: MKT 3350 and ISQS 2445. Scientific marketing research methods; emphasis on collection, analysis, and interpretation of data as applied to the solution of marketing problems.

4351. Retail Management (3:3:0). Prerequisite: A 3-hour accounting course, MKT 3350 and 3353, or concurrent enrollment in MKT 3353. Comprehensive introduction to an evaluation of retailing with emphasis on profit elements, pricing and merchandising policies, inventory and merchandising control.

4354. Market Promotion (3:3:0). Prerequisite: MKT 3350 and 3352. Management of the promotional mix of advertising, personal selling, and sales promotion. Emphasizes the interaction and coordination of these three elements and relates them to the other components of the firm's marketing strategy.

4356. Advanced Marketing Research (3:3:0). Prerequisite: MKT 3350 and 3356. Primary data collection and interpretation with emphasis on measurement. Project oriented.

4358. International Marketing (3:3:0). Prerequisite: MKT 3350 and senior standing. A survey of international marketing principles, cultural differences, world markets, and political constraints.

4359. Sales Management (3:3:0). Prerequisite: MKT 3350 and 3356. Problems and methods of organization and administration of sales departments, sales operations, sales control, sales promotion, and sales policies.

4360. Marketing Problems (3:3:0). Prerequisite: 15 hours of marketing. Capstone course utilizing a case-oriented approach to synthesize and integrate marketing policies and strategies.

4361. Senior Honors Seminar (3:3:0). In-depth discussion of a variety of contemporary issues affecting marketing decision making, including social, governmental, and business-related issues. (By invitation only.)

Courses in Business Law. (BLAW)

3391. Business Law I (3:3:0). Nature and source of law, courts and procedure, contracts, Texas law of separate and community property, agency.

3392. Business Law II (3:3:0). Second course in business law. Law of negotiable instruments, business organizations, including partnerships and corporations sales.

3393. Real Estate Law (3:3:0). Rights in land; classification of estates; acquisition and creation of property rights; titles; and common conveyances.

3394. Insurance Law (3:3:0). General principles of insurance law; the insurance contract; insurance agents and their powers; rights under fire, life, and accident policies; taxation affecting insurance policies; insurance and community property rights.

3395. Oil and Gas Law (3:3:0). General contracts, oil and leases and their interpretation, titles, royalty, proration, and conservation of oil and gas, regulations governing drilling operations, government lands, cases on oil and gas.

4391. CPA Law Review (3:3:0). Review of business law, with emphasis on subject matter appearing frequently in the CPA law examinations.

Courses in Business Secretarial Administration. (BSA)

The equivalent of BSA 1237 is a year of typewriting instruction in high school or a semester of beginning typewriting at another college. The equivalent of BSA 2337 is a year of high school shorthand (Gregg system) or a semester of beginning shorthand (Gregg system) at another college.

1237. Beginning Typewriting (2:2:3). Fundamentals of touch typewriting. Emphasis on developing keyboarding and formatting simple letters and reports.

1337. Typewriting for Business (3:3:2). Prerequisite: BSA 1237 or equivalent. Continued keyboarding accuracy and speed (to minimum 55 wpm) development. Organization and display of typewritten statistical data, reports, letters, etc., to facilitate easy comprehension.

2337. Shorthand Theory (3:3:2). Beginning course in shorthand. Emphasis on automatizing brief forms, fluent reading of shorthand, acquiring a basic shorthand vocabulary, and recording from familiar or correlated material.

2338. Shorthand Dictation (3:3:2). Prerequisite: BSA 1337, 2337, or equivalent. Emphasis on expanding shorthand vocabulary and on improving shorthand recording speed. Development of pretranscription skills.

3337. Shorthand Transcription (3:3:2). Prerequisite: BSA 1337, 2338. Emphasis on developing rapid and accurate transcription of mailable office communications from shorthand notes recorded from unfamiliar dictation. Continued development of shorthand recording skill.

3338. Office Systems and Productivity (3:3:2). Prerequisite: BSA 1337. Machine-transcription skill development. Study of office automation relative to office productivity. Investigation of copying, printing, and reprographics; micrographics; and communications office systems.

4337. Word Processing (3:3:2). Prerequisite: BSA 1337, 3338. Nature, benefits, and limitations of word processing as applied in modern business offices. Investigation of word processing procedures, personnel, and equipment. Text-editing skill development.

4338. Executive Secretarial Procedures (3:3:0). Prerequisite: BSA 1337, 2337. Role of the professional executive secretary in facilitating managerial functions. Appointments, travel, correspondence, reports, meetings and minutes, office supplies, public relations, filing, financial responsibilities, etc.

4339. Administration of Office Operations (3:3:0). Prerequisite: BSA 3338. Work measurement and simplification; office systems analysis; procedures design; office manuals; forms design; production, quality, and cost control of office operations; administration of human resources.

4340. Office Simulation (3:3:0). Prerequisite: BSA 1337, 2338, 4338. Development — through case studies, role-playing, and in-basket exercises — of decision-making responsibilities of administrative and executive secretaryship. Production of work under time pressure.

College of Education

Professor Richard E. Ishler, *Dean*

Professors Ainsworth, Angelotti, Askins, Beckner, Bensberg, Biggers, Cornett, Crowder, Dixon, Kelsey, Little Soldier, Mehaffie, Nevius, Reavis, Roberts, Rooze, Simmons, Skoog, Welton, Willingham, Willis, and Zintgraff; Associate Professors Bloomer, Butler, Candler, Carter, Champlin, Christian, Denham, Esteves, Ewalt, Filgo, Gades, Hovey, B. Johnson, D. Johnson, Kimmel, Koeller, Lawrence, Maddux, Manley, Mezack, Parr, Peterson, Platten, Purkerson, Reid, Ronshausen, Sowell, Sparkman, Taylor, and Trang; Assistant Professors Bates, Blanchard, Brownlee, Correa, Geer, T. Irons, and Price; Lecturers Bobo, Harris, and D. Irons; Adjunct Assistant Professor Teague.

The College of Education was established as a major component of the University in 1967. It is accredited by the Texas Education Agency, the Southern Association of Secondary Schools and Colleges, and the National Council for Accreditation of Teacher Education. Through this latter accreditation, Texas Tech University holds membership in the American Association of Colleges for Teacher Education. This membership signifies that the teaching certificate earned at Texas Tech is accepted in a majority of the states in the nation through reciprocity with other members of the association.

The primary function of the College of Education is to provide degree and teacher certification programs for both undergraduate and graduate students who plan a career in teaching in the elementary and secondary schools. In addition the graduate program offers opportunities for persons to qualify as specialists in a number of fields at various school levels.

Professional preparation is offered for persons intending to occupy or occupying positions in universities, senior colleges, and community junior colleges. Instruction related to administration, curriculum, teaching, counseling, educational planning, public relations, and other aspects of higher education is available.

The general curricula for each undergraduate degree program are outlined in this section; graduate degree programs leading to the Master of Education degree, the Doctor of Education degree, and the Professional Teaching Certificate are detailed in the *Graduate Catalog.* A descriptive list of the undergraduate courses offered by the College of Education is presented in the following pages. Any deviation from the approved curriculum for a particular degree must be approved by the student's faculty advisor and by the office of the Dean of the College of Education.

Advisory Program. The advisory program in the College of Education is designed to provide aid to each student in planning and carrying out the appropriate degree and teaching certification program. Each student, including transfers, who enrolls in the College of Education is assigned to a faculty advisor. *Each student is expected to have at least one individual interview each semester with the advisor during which the current semester's work will be evaluated and the next semester's plan will be developed.*

The faculty advisor is responsible for (1) assisting the student in planning a program and in selecting courses to be taken each semester prior to registration, (2) advising the student in planning a balanced class schedule, (3) helping the student in selecting the proper areas of specialization and/or teaching fields, (4)

advising the student in meeting admission and retention standards of teacher education and student teaching, and (5) serving as a counselor on personal problems upon request. Either advisor or advisee may ask the Dean of the College for a change in assignment.

Degree and Teaching Certification Programs. The College of Education offers work at the undergraduate level leading to the degree of Bachelor of Science in Education with a major in early childhood, elementary, secondary, or all-level education. These programs are designed especially for those who plan a career in teaching in the preschool, elementary, and secondary schools in any of the areas of specialization authorized. In accordance with the choice of the individual student, the degree program will satisfy the legal requirements of Texas for a teaching certificate at the appropriate grade level and in the desired teaching fields. Since the Bachelor of Science in Education degree includes the requirements for certification to teach, these must be completed before the degree can be awarded. Descriptions of graduate level endorsement programs may be found in the *Graduate Catalog*.

Students in certain other colleges may complete the requirements for teacher certification when these are taken together with an appropriate teaching major or specialization. Generally, all persons seeking the Teachers of Young Children certificate will enroll in the College of Education or the College of Home Economics; those students seeking certification at the elementary school level (including kindergarten) will enroll in the College of Education; those interested in secondary school teaching may enroll in the College of Education or in the College of Arts and Sciences, the College of Agricultural Sciences, or the College of Home Economics, depending upon the specialized field desired.

Academic Foundations. During the freshman and sophomore years the student normally completes the academic foundations requirement for both the Bachelor of Science in Education degree and a teaching certificate. The work in professional education and the advanced courses in the academic specialization for elementary and the two teaching fields or broad field composite major for secondary are usually taken in the junior and senior years.

Academic Specialization (Elementary Level) and Teaching Fields (Secondary Level). The student pursuing the Bachelor of Science in Education degree with a major in early childhood or elementary education may begin academic specialization in the freshman year. The student seeking the Bachelor of Science in Education degree in the secondary curriculum may also begin work in the teaching field(s) during the freshman year. A majority of the work in the academic specialization (early childhood and elementary) and the teaching field (secondary) must be completed prior to admission into student teaching.

Professional Education. The professional education sequence for the early childhood, elementary, and secondary curricula begins the first semester of the junior year. The standards for admission to a program leading to teacher certification are presented in the section of the catalog entitled Teacher Education. The student must complete 12 semester hours in professional education before admission into student teaching in the early childhood and elementary curricula and 9 semester hours in the secondary curriculum. Failure to do so may preclude completion of the degree and certification program in four years.

Recently developed programs provide the opportunity for a limited number of students to enroll in a block of professional education courses totaling 6 to 12 semester hours. These courses are taught by teams of professors and involve working with public school teachers and students in a school setting for several hours each week. Students interested in making arrangements to enroll in one or more of these programs should talk to an advisor well in advance of the semester in which such enrollment is desired.

Student Load. The normal load for a student in the College of Education is 16 semester hours. No student will be permitted to enroll in more than 18 semester hours, including work taken by correspondence, without written approval from the area chairperson or associate dean. During the semester in which student teaching is taken the maximum load is 16 semester hours.

Length of Degree Program. The Bachelor of Science in Education degree in early childhood, elementary, and secondary education can be completed within normal load limits in eight semesters. A student may, however, be required to attend either one summer term or a ninth semester due to failure to meet the admission standards into teacher education and student teaching, poor planning or scheduling, or for other reasons. Not later than the second semester of the sophomore year, the student should complete a degree and certification plan. Assistance in completing the degree and certification plan is to be obtained from the office of the Dean of the College of Education. An Intent to Graduate form should be filed in the office of the Dean of the College of Education during the last semester before graduation.

Bachelor of Science in Education — Early Childhood Major. The curriculum established for students seeking the Teachers of Young Children certificate is designed to provide (1) a broad base in academic foundations essential to teaching children ages three through eight effectively; (2) a specialization in child development; (3) an emphasis that includes music, art, physical education; (4) an intensive preparation in professional education, including student teaching; and (5) electives chosen under advisement to round out the personal and professional development of the individual. The general requirements for the degree are as follows:

I. Academic foundations (52 semester hours).
   General Education — specified courses from such areas as English, history, political science, science, mathematics, foreign language, and physical education, ROTC, or marching band.
   Related Studies — specified courses from areas such as anthropology, economics, geography, psychology, sociology, art, classics, music, philosophy, physical education, theatre arts, multicultural education, and speech or mass communication.

II. Academic specialization (37 semester hours).
   A minimum of 25 hours is specified for students seeking Teachers of Young Children certification. Courses include child development, parenting, family relations, and nutrition. The remaining 12 hours are specified courses in music education, art education, physical education, and 3 hours selected by the student and advisor.

III. Professional development and field experiences (32 semester hours).
   For certification, 24 hours of professional education and 8 hours of field experiences are required.

IV. Electives.
Sufficient with the above to total a minimum of 126 semester hours.
Students pursuing the Teachers of Young Children certification should consult with their advisor as soon as possible concerning program sequence and alternatives. Courses taken prior to degree plan approval may not meet degree requirements.

Bachelor of Science in Education – Elementary Major. The curriculum established for elementary education is designed to provide (1) a broad base in academic foundations essential to teaching effectively in the elementary schools; (2) a specialization in one subject field; (3) an emphasis in art, health, physical education, and music; (4) an intensive preparation in professional education, including student teaching, and in elementary content courses; (5) electives chosen under advisement to round out the personal and professional development of the individual. The general requirements for the degree are as follows:

I. Academic foundations (50 semester hours).
General Education — specified courses from such areas as English, history, political science, science, mathematics, foreign language, and physical education, ROTC, or marching band.
Related Studies — specified courses from areas such as anthropology, economics, geography, psychology, sociology, art, classics, music, philosophy, physical education, theatre arts, and speech or mass communications. EDCI 1190, Introduction to Professional Education, is required for freshmen.

II. Academic specialization (36 semester hours).
Plan I requires a minimum of 18 hours in an approved area of specialization (see catalog section entitled "Teacher Education"). The remaining 18 hours are specified courses in music education, art education, physical education, and health education.
Plan II requires a minimum of 24 hours in an approved area of specialization. The remaining 12 hours are specified courses in music education, art education, physical education, and health education.

III. Professional development and field experiences (32 semester hours).
Elementary Education — for certification, 24 hours of professional education and 8 hours of field experiences are required.

IV. Electives.
Sufficient with the above to total a minimum of 126 semester hours.
Students pursuing a major in elementary education should consult with their advisor as soon as possible concerning program sequence and alternatives. Courses taken prior to degree plan approval may not meet degree requirements.

Bachelor of Science in Education – Secondary Major. The curriculum established for secondary education is designed to provide (1) a broad base in academic foundations believed to be essential for effective teaching in the secondary schools in any subject or field; (2) a specialization in two teaching fields, or in a broad teaching field; (3) an intensive preparation in professional education including student teaching; (4) electives to round out the personal and professional development of the individual.

In this program the student may begin work in one of the major teaching fields in the freshman year. This work will be done outside the College of Education in departments offering the teaching field listed in the section of this catalog entitled "Teacher Education." The general requirements for the degree are as follows:

I. Academic foundations (50 semester hours).
General Education — specified courses from such areas as English, history, political science, science, mathematics, foreign language, and physical education, ROTC, or marching band.
Related Studies — specified courses from areas such as anthropology, economics, geography, psychology, sociology, art, classics, music, philosophy, theatre arts, and speech. EDCI 1190, Introduction to Professional Education, is required for freshmen.

II. Teaching fields (48 semester hours).
Plan I requires a minimum of 24 hours in each of two fields (see catalog section entitled "Teacher Education").
Plan II is the broad field or composite plan which requires a minimum of 48 hours in a broad field.
In some instances, courses in the academic foundations may be included as part of the teaching fields.

III. Professional development and field experiences (24 semester hours).
Secondary Education — for certification, 18 hours are required; however, for degree purposes, 6 additional hours of electives from professional education are required.

IV. Electives.
Sufficient with the above to total a minimum of 126 semester hours.

Students pursuing a major in secondary education should consult with their advisor as soon as possible concerning program sequence and alternatives. Courses taken prior to degree plan approval may not meet degree requirements.

Courses in Early Childhood/Elementary Education. (ECEL)

2190. Projects in Early Childhood Education (1:1:0). Exploratory experiences in early childhood education programs. May be repeated for credit.

2191. Projects in Elementary Education (1:0:2). Exploratory experiences in educational programs through the elementary school level. May be repeated for credit.

2317. School and Family Relationships (3:3:0). Development of school and community interaction, including parent-teacher relationships and the school's role in parent education.

3191. Correlated Field Experience (1:0:2). Prerequisite: Concurrent enrollment in an appropriate professional education course. Observation and supervised teaching of an elementary subject area at a field site (e.g., mathematics, science, language arts, etc). May be repeated for credit.

3310. Introduction to Early Childhood Education (3:3:0). Prerequisite: Junior standing. Bases for programs, methods, and materials in early childhood education.

3320. Child Development and the Elementary School Curriculum (3:3:0). Prerequisite: Junior standing; eligibility for or admission to the teacher education program. Principles of child development as they apply to the elementary school curriculum.

3350. Language Arts in the Elementary School Curriculum (3:3:0). Prerequisite: Junior standing. Bases for programs, methods, and materials.

3360. Social Studies in the Elementary Curriculum (3:3:0). Prerequisite: Junior standing. Bases for programs, methods, and materials.

4106. Seminar in Elementary Education (1:1:0). Prerequisite: Junior standing. The study of selected problems, topics, or issues in elementary education. May be repeated for credit.

4310. Cognitive and Language Development in Early Childhood (3:3:0). Role of early childhood education in concept building and in development of adequacy in verbal communication.

4350. Children's Literature (3:3:0). Prose and poetry for children under twelve, including standards for judging and criteria for selecting children's books.

4370. Teaching Arithmetic in the Elementary School (3:3:0). Prerequisite: Junior standing. Bases for programs, methods, and materials.

4375. Teaching Science in the Elementary School (3:3:0). Prerequisite: Junior standing. Bases for programs, methods, and materials.

4390. Student Observation and Teaching in the Kindergarten (3). Prerequisite: Admission to student teaching and completion of approximately 90 hours of work including a minimum of 6 hours of course work specifically required for kindergarten endorsement. Classroom observation and teaching of children in the early childhood classroom.

4391. Student Observation and Teaching in the Elementary School (3). Prerequisite: Attainment of admission standards to student teaching applicable to secondary or all-level certification. See "Student Teaching" section of catalog for details.

4691. Student Teaching in the Elementary School (6). Prerequisite: Attainment of admission standards to student teaching, completion of approximately 90 hours of work, and 12 hours of professional education.

Courses in Educational Psychology. (EPSY)

3190. Special Topics in Educational Psychology (1). Study of specialized topics in educational psychology and foundations of education.

3330. Educational Psychology (3:3:0). Prerequisite: Junior standing; eligibility for or admission to the teacher education program. Educational and psychological principles and basic knowledge in professional education and in teaching.

4259. Student Personnel Staff and Resident Student Development (2:2:0). Orientation to the educational processes which occur in the residence halls with emphasis on the role of the student personnel staff in resident student development.

4314. History and Philosophy of Education (3:3:0). Prerequisite: Senior standing and 9 hours of education. Influences of historical developments and philosophical concepts upon education as the foundation of American democracy.

4323. Foundations of Educational Sociology (3:3:0). Prerequisite: Senior standing and 9 hours of education. A microcosmic examination of the culture of the school with respect to its socializing, maintenance, and selection/allocation functions.

4339. Practicum in Proctor-assisted Instruction (3). Prerequisite: EPSY 3330 or approval of instructor. Leadership experience in classroom small group dynamics. May be repeated; only first enrollment may count toward degree.

4357. Guidance Studies IV (3:3:0). Introduction to techniques of working with students, teachers, counselors, and parents.

4387. Educational Measurement and Evaluation (3:3:0). Prerequisite: Senior standing and 9 hours of education. A foundation course in problems of measurement and evaluation by the classroom teacher in the public schools.

4399. Individual Study (3). Prerequisite: Consent of instructor. Independent study of selected topics in educational psychology and the foundations of education.

Courses in Special Education. (EDSP)

2100. Introductory Experiences with Handicapped Children (1:1:0). Supervised experiences in community installations serving handicapped children.

3300. Educational Characteristics of Exceptional Students (3:3:0). Characteristics of major categories of exceptional students and educational implications.

3370. Assessment Procedures for Exceptional Students (3:3:0). Students observe and evaluate exceptional learners and synthesize the evaluation findings into a plan for the child's total environment.

3371. Alternatives for Intervention (3:3:0). Behavioral approach to classroom management, instructional programming, and skills development for exceptional students.

4190. Advanced Field Experience in Special Education (1:1:0). Prerequisite: Completion of sequence of courses in particular area of exceptionality and attainment of admission standards in student teaching. May be repeated for credit for a maximum of 3 semester hours of credit if deemed necessary.

4320. Education of the Exceptional Student (3:3:0). Curriculum, methods, and materials in teaching handicapped students.

4322. Teaching the Trainable Mentally Retarded (3:3:0). Curriculum, methods, and materials in teaching the trainable level mentally retarded.

4332. Techniques in Teaching Exceptional Children (3:3:0). Adaptation in curriculum, methods, and materials in education of exceptional children.

4370. Educational Programming for Exceptional Students (3:3:0). Advanced curriculum, methods, and materials in teaching exceptional students.

4371. Coordinating Services for Exceptional Children (3:3:0). Facilitating the interrelationship of varied services for exceptional students. Focus includes parental, professional, and paraprofessional involvement.

4390. Student Teaching in Special Education (3:3:0). Prerequisite: Attainment of admission standards to student teaching; completion of sequence courses in the particular area of exceptionality. Supervised teaching with the mentally retarded, physically handicapped, minimally brain injured, language and/or learning disabilities, and the emotionally disturbed.

4690. Practicum in Special Education (6:6:0). Prerequisite: Completion of sequence of courses in the particular areas of exceptionality. Observation and supervised teaching with the deaf, emotionally disturbed, mentally retarded, physically handicapped, or children with minimum brain dysfunction.

Courses in Curriculum and Instruction. (EDCI)

1190. Introduction to Professional Education (1:1:0). An introduction to professional education including orientation to degree and various types of teacher certification programs. Required of freshmen in the College of Education.

3130. Basic Principles of School Law (1:1:0). Law dealing with school policies and procedures affecting teacher relationships with students, parents, and administrators. Students may enroll concurrently for one, two, or three hours.

3332. Foundations of Bilingual Education (3:3:0). Overview of curriculum, assessment processes, teaching strategies, research, and legislation related to bilingual education.

3333. Introduction to Teaching in a Multicultural Setting (3:3:0). Prerequisite: Junior standing. Teaching strategies, methods, materials, and curricula for equality in educational opportunity.

3340. Foundations of Reading Instruction (3:3:0). Prerequisite: Junior standing. Overview of reading skills, methods of classroom organization, scope and sequence of programs.

3341. Teaching Reading in the Content Fields (3:3:0). Prerequisite: Junior standing. Issues, materials, and approaches in teaching reading in content fields.

3386. Interdisciplinary Approaches to Aesthetic Education (3:3:0). Prerequisite: EPSY 3330 and junior standing or consent of instructor. Study of and experience in developing interrelated arts curricula and exploring teaching strategies in aesthetic education in the elementary and secondary schools.

4323. Audiovisual Education (3:3:1). An introductory course on methods and techniques in the utilization of instructional media and the preparation of materials for use in teaching. Laboratory in operation of instructional equipment required.

4334. Teaching Math, Science, and Social Studies to the Linguistically Different Student (3:3:0). Learning styles, methodologies, and vocabularies for teaching content areas to the linguistically different students.

4342. Evaluation of Reading Performance (3:3:0). Prerequisite: EDCI 3340, 3341, or consent of instructor. Basic principles of evaluation applied to reading performance.

4343. Linguistics in Reading Instruction (3:3:0). Prerequisite: EDCI 3340, EDCI 3341, or consent of instructor. Application of content and principles from the field of linguistics to reading instruction.

4344. Approaches and Materials in Teaching Reading (3:3:0). Prerequisite: EDCI 3340, 3341, or consent of instructor. Prepares students to work with the basal, language experience, and individualized reading approaches.

4345. Field Experience in Teaching Reading (3:3:0). Prerequisite: EDCI 3340 or 3341. Work with school-aged children in a tutorial role.

Courses in Secondary Education. (EDSE)

2192. Projects in Secondary Education (1). Arranged experiences as a tutor and/or teacher's aide in a secondary school. May be repeated for credit.

3100. Selected Topics in Secondary Education (1). Study of specialized topics in secondary education. May be repeated for credit.

3192. Advanced Projects in Secondary Education (1). Arranged experiences as a tutor and/or teacher's aide. May be repeated for credit.

3300. Foundations of Secondary Education (3:3:0). Prerequisite: Junior standing; eligibility for or admission to the teacher education program. Introduction to secondary education; basic principles underlying the secondary school program. Field experiences arranged.

3321. Curriculum Development in Secondary Education (3:3:0). Prerequisite: Junior standing, EPSY 3330, EDSE 3300 or equivalent. Foundations of curriculum development, curriculum patterns, preparation of resource/teaching units, and issues in curriculum development. Field experiences required.

4320. Teaching in Secondary Schools (3:3:0). Prerequisite: Senior standing; EPSY 3330, EDSE 3300, 3321, or equivalents. Foundations of teaching, methods and techniques, evaluation and classroom management problems.

4351. Teaching Grammar, Composition, Spelling, and Listening (3:3:0). Prerequisite: EDSE 3300, 3321, and EPSY 3330. Preparation for teaching grammar, usage, punctuation, composition, spelling, critical thinking, and listening in junior and senior high schools.

4352. Selection of Youth Literature for Secondary School Teachers and Librarians (3:3:0). Prerequisite: 6 hours of education. Selection of materials, media, resources, and equipment for various students in the secondary school.

4353. Teaching English to the Culturally Diverse (3:3:0). Prerequisite: 6 hours of education or by permission. Methods, materials, and curricula for presenting the English language to culturally and linguistically diverse students.

4354. Teaching English Language and Literature to the Bilingual Adolescent (3:3:0). Prerequisite: 6 hours of education. Problems in teaching English and literature to bilingual adolescents. Analysis of language differences as a basis for instruction.

4355. Teaching in the Middle School (3:3:0). Prerequisite: EPSY 3330, EDSE 3300. A study of the characteristics of emerging adolescents; the rationale, organizational structure, curriculum, and instruction of the middle school.

4360. Teaching the Social Studies in the Secondary School (3:3:0). Prerequisite: EDSE 3300 and EPSY 3330 or equivalents. Methods, techniques, and evaluation procedures appropriate to teach various subjects in the area of social studies. Includes supervised practice in the selection of materials, visuals, and microteaching.

4376. Methods in Science Teaching (3:3:0). Prerequisite: Pursuing a teaching field in science; EDSE 3300 and EPSY 3330 or equivalents. Focus on the curriculum, methods, and materials related to science instruction in the secondary schools.

4380. Methods of Teaching Business Subjects I (3:3:0). Prerequisite: ECO 2311, 2312. Methods, content, and materials to teach courses in basic business subjects, bookkeeping and accounting, and clerical procedures.

4381. Methods of Teaching Business Subjects II (3:3:0). Prerequisite: BSA 1337 and 2338 or equivalents. Methods, content, and materials to teach courses in typewriting, shorthand transcription, COE/POE, secretarial procedures, and related courses.

4392. Student Observation and Teaching in the Secondary School (3). Prerequisite: Attainment of admission standards to student teaching applicable to elementary or all-level certification. See "Student Teaching" section of catalog for details.

4399. Individual Study (3). Prerequisite: 9 hours of education and consent of instructor. Independent study focusing on curriculum development and teaching strategies.

4692. Student Teaching in the Secondary School (6). Prerequisite: Attainment of admission standards to student teaching; completion of 90 hours of work, 9 hours of education, including EPSY 3330, EDSE 3300, 3321, plus 15 hours of the course work in each of the two teaching fields or 30-36 hours on the 48-hour program.

College of Engineering

Professor Jimmy H. Smith, *Interim Dean*

Engineering involves the application of scientifc and mathematical principles and knowledge to achieve solutions to technical problems which confront society. Students studying in the College of Engineering must therefore develop understandings of the forces at work within nature so that these forces may be controlled and directed. It is in this way that engineering knowledge assists in achieving human goals. Mankind's advancement is the common objective of each segment within the college: architecture, computer science, engineering, and technology.

Each academic program includes not only education in the basic sciences and mathematics but also its application in solving human problems.

All Bachelor of Science degrees in engineering and engineering technology are accredited by the Accreditation Board for Engineering and Technology. The Bachelor of Architecture degree is accredited by the National Architectural Accreditation Board.

The aim of the engineering curricula of the College of Engineering is to impart a basic knowledge of the fundamentals of engineering, with specialization in one particular branch to that extent which experience indicates to be desirable. The course of study is planned to give the student training which is not readily obtainable after graduation. As an aid in developing a professional attitude, the importance of the qualities of honesty, loyalty, thoroughness, and industry is emphasized. A desire for learning and for knowledge of the ethics of the profession is also fostered. As much specialization as possible is left to the students' later employment. Experience has shown that this type of training produces the most successful engineers.

Upon graduation, the student usually spends a period of time in subordinate positions, obtaining experience and preparing for the more important work of the executive, designer, consulting engineer, teacher, researcher, or supervisor of manufacturing operations. Engineering education is recognized as desirable preparation for a commercial career. Indeed, surveys of employment records disclose that men and women with engineering educations have found their way into nearly every type of vocation. Attention is called to the fact that in a civilization such as ours, in which one is at all times in contact with the results of our modern industrial development, no type of education is more relevant than that leading to an engineering degree.

Studies in the Division of Architecture concentrate on the concept that architecture and design are embodiments of the attitudes and ideas of society; that mankind's needs and requirements are basic to the realization of form and functional expressions; and that the requirements of our changing environment are major factors in architectural design determination.

The program leading to the degree of Bachelor of Science in Engineering Technology is offered in the specialization areas of construction, electrical-electronics, and mechanical technology. The degree is designed for students whose basic aptitude and interests are in the application of established procedures to the solution of technical problems rather than in the creative profession of engineering. It is considered to be a terminal occupational degree preparing students

for technical careers in such fields as applied design, construction, operations, maintenance, quality control, and sales. Prospective students should make inquiry concerning requirements, opportunities, and limitations of the engineering technology programs. Curricula outlines and course descriptions are given in this catalog under the Department of Engineering Technology.

A degree in textile technology and management is offered by the Department of Textile Engineering. This program prepares students to assume technical and leadership positions in the nation's textile industry.

For the student wishing to obtain a broad-based general degree, the Bachelor of Arts is offered by the College of Engineering. The Bachelor of Arts degree is not intended as preparation for entry into the practice of engineering but offers the student interested in environmental resources, systems analysis, and ecological control an insight into today's problems and their possible solutions.

Undergraduate Degrees. The College of Engineering offers the following four-year professional engineering curricula, each leading to the degree of Bachelor of Science in the respective engineering fields: agricultural, chemical, civil, electrical, industrial, mechanical, petroleum, and engineering physics. A program leading to the Bachelor of Science degree with a major in computer science is administered by the Electrical Engineering Department. Work leading to the degree of Bachelor of Science in Textile Technology and Management is available under the administration of the Textile Engineering Department. Engineering technology curricula with specialization in construction, electrical-electronics, and mechanical technology lead to the degree of Bachelor of Science in Engineering Technology. In the Division of Architecture, two five-year curricula are offered leading to the degree of Bachelor of Architecture with specializations in design and structures. A dual degree plan is offered in architecture and civil engineering. A College of Engineering interdepartmental program leads to the Bachelor of Arts degree.

The College of Engineering is divided into instructional departments which offer course work and supervise the degree programs. Specific curricula are designed by the departments for each of the degree programs and are presented in special tables on the following pages along with a descriptive list of the courses offered by each department.

The courses listed in individual curricula are those prescribed for the various degrees, and the arrangement by freshman, sophomore, junior, and senior years is the recommended sequence of courses, whether students begin them in the summer or during the long session. Before registration for each semester, a student should check course prerequisites carefully and be certain to include in that semester's work the courses which are prerequisite to the ones prescribed for the following semester.

General Requirements of the College of Engineering. The requirements for an engineering degree include many courses that are common to all engineering degree plans. Most of these courses are given at the freshman and sophomore level, and though the beginning student is required to select a major, the absolute choice is not of vital concern until the latter part of the sophomore year. Specific curricula have been established for each degree program and are given in detail on the following pages.

These general regulations apply to all degrees:

1. Students planning to complete one of the Bachelor of Science in Engineering degrees must have adequate preparation in mathematics as evidenced by placement tests and high school credits, or they must earn credit in college courses in algebra and/or trigonometry. An alternate freshman curriculum is provided for those students with inadequate preparation in mathematics.

2. A student in the College of Engineering is expected to earn credit in the particular courses listed in one of the curricula and to follow the sequence of courses therein recommended.

3. Any substitution or deviation in subject matter specified in a curriculum requires the written approval of the Dean of the College of Engineering and the chairperson of the student's major department. Degree credit for electives requires written approval by the chairperson of the department involved. Technical electives must be selected from advanced level engineering, mathematics, or science courses. Courses considered remedial or regressive will not be accepted.

4. Courses transferred from another institution will be evaluated in the office of the Dean of the College of Engineering for substitutions in a given curriculum.

5. With the approval of a student's major department chairperson, 3 hours of the advanced ROTC credits may be counted for the unspecified elective courses in the engineering and engineering technology degrees.

6. General University regulations allow a maximum of 18 semester hours of work toward an undergraduate degree to be completed by correspondence. Of this general total of 18 hours, however, the College of Engineering specifies that no more than 9 hours of credit may be obtained in this way in courses in engineering, science, and/or mathematics. All correspondence work taken for degree credit requires written approval of the Dean of the College of Engineering. Students who have failed courses may not subsequently use a correspondence course or credit by examination to gain credit for the course.

7. A student in the College of Engineering may use for degree credit a limited number of courses by successfully completing an appropriate subject examination administered by an approved college testing agency or, in some cases, through special departmentally prepared examinations covering a course or courses in a curriculum. Credit by examination is generally allowed only for beginning courses in mathematics, English, chemistry, physics, computer programming, history, political science, and engineering graphics. Credit for some courses above the freshman level is available through departmentally prepared examinations but students must present to the academic deans a written request to take the examination. The petition must state the extent and manner in which the student received competence in the subject. Upon approval of the dean the petition should be presented to the chairperson of the department concerned for arrangements to take the examination.

Credit by examination is not allowed for foreign language courses numbered below 4000 for languages considered to be the student's native or alternate language.

8. Before enrolling in major courses shown in the curriculum tables for the junior or senior years, engineering students must have at least a 2.0 grade-point average in each of three categories: overall, major, and mathematics and science. All grades for repeated courses are included in the above calculations. Students

who do not meet these requirements will be advised by their major department as to which courses must be taken to remove deficiencies. These are minimum College of Enginering requirements; other requirements are listed in the departmental sections.

9. A student must file an "Application for Degree" with the office of the Dean of the College of Engineering at least one year before the anticipated date of graduation. Subsequently, the student will receive a list of courses and be apprised of the number of grade points that are lacking.

In making this application, students must indicate the year's catalog under which they plan to graduate, since they must meet all of the requirements of a specific year's catalog. This must be a year during which the student is registered in the College of Engineering, with the restriction that all requirements for an undergraduate degree must be completed within seven years of the date of the catalog chosen. Also see Uniform Degree Requirements of the University.

10. A student who has completed the requirements for a first bachelor's degree from the College of Engineering may acquire a second by completing the curriculum for the second degree with the following restriction: at least 27 hours of the second degree requirements must be from courses not counted in attaining the first degree.

11. A candidate for a degree in the College of Engineering should file a Personnel Data Form with the Placement Service.

Foreign Students. Because of the large numbers of foreign students seeking admission to programs in the College of Engineering, it has become necessary to establish special admission requirements. Foreign students entering the college from their countries' high schools must have grades which are the equivalent of an average grade of B on the U.S. scale. High school grades in mathematics and science courses must also average B, and all entering foreign students must achieve scores of 550 or higher on the Test of English as a Foreign Language (TOEFL). Foreign students seeking to transfer to the College of Engineering from other colleges or universities should contact the Director of Foreign Student Admissions for information about specific transfer requirements.

Freshman Programs. The College of Engineering expects entering students to meet certain admission requirements. Students who qualify, as evidenced by their high school records and placement tests, will be assigned to the freshman program shown in the departmental curriculum. Entering engineering and architecture (structures specialization) students with inadequate preparation in mathematics will be required to complete MATH 1320, College Algebra, and/or MATH 1321, Trigonometry, in addition to the courses shown in the departmental curriculum. The most satisfactory plan for completing these courses without delay is to attend summer school before the first long session.

Engineering students who need algebra and trigonometry, but who are unable to take advantage of summer school, should schedule the following:

Alternate Freshman Year for Engineering Students.

Fall		*Spring*	
MATH 1321, Trigonometry	3	MATH 1350, Anal. Geom.	3
MATH 1320, Coll. Alg.	3	ENGL 1302, Adv. Coll. Rhet.	3
E GR 1306, Engr. Graphics I	3	ENGR 1305, Engr. Anal. I	3
ENGL 1301, Ess. Coll. Rhet.	3	CHEM 1308, Prin. Chem. II	3
CHEM 1307, Prin. Chem. I	3	CHEM 1104, Prin. Chem II (Lab.)	1
CHEM 1103, Prin. Chem I (Lab.)	1	HIST 2300, Hist. of U.S. to 1877	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	16*		16*

SUMMER SESSION

First Term		*Second Term*	
MATH 1351, Calc. I	3	MATH 1352, Calc. II	3

*Exclusive of P.E., Band, or ROTC.

Similar adjustment to compensate for deficiencies in recommended admission requirements can be made in the freshman programs in architecture, in engineering technology, and in textile technology and management.

Special consideration will be given to applicants with strong high school backgrounds, even though they may not meet some of the specific entrance requirements. It should be noted, however, that most students who are admitted with fewer than the recommended qualifications should anticipate its requiring more than two semesters for the completion of the freshman program.

Requirements for the Bachelor of Arts Degree. The College of Engineering offers a Bachelor of Arts degree with special emphasis on the application of scientific discovery and the effect of technology upon society. This degree is available for students who do not want to practice engineering, but who are interested in today's technical problems. This degree also can be used as a preprofessional program for those interested in medicine, dentistry, and law. Prospective students should make inquiries concerning requirements, opportunities, and limitations of the Bachelor of Arts degree.

Each student studying toward the Bachelor of Arts degree offered by the College of Engineering is expected to develop, in consultation with a faculty advisor, a degree program which meets his or her individual needs. Each program must meet the following minimum general requirements for this degree:

	Semester Hours
1. English	6
2. Mathematics (beyond algebra and trigonometry)	12
3. Basic Laboratory Science	16
4. Social Science and Humanities (Including 12 semester hours of required history and political science)	24
5. Engineering, technology, and advanced science	42
6. Electives	21
7. P.E., Band, or ROTC	2
Minimum Total	123

The student's program should be developed no later than the first semester of the junior year and must be approved by the Dean of the College of Engineering. At least 27 hours of the engineering, technology, and advanced science courses and 12 hours of the electives must be junior or senior level work.

Advanced Degrees in Engineering. Programs are available through the College of Engineering leading to Master of Science and Doctor of Philosophy degrees in the fields of computer science and chemical, civil, electrical, industrial, and mechanical engineering, and to a Doctor of Philosophy degree with interdisciplinary combinations of the engineering fields and/or the physical and biological sciences and mathematics. In addition to these programs, the College of Engineering offers a Master of Engineering degree designed especially for the practicing engineer desiring to continue professional education. Currently off-campus programs are operating in Amarillo and Borger. A Master of Architecture degree is offered through the Division of Architecture.

Admission to the Graduate School is based upon an above-average undergraduate record and satisfactory standing on the Graduate Record Examinations. The regulations and requirements of the Graduate School are given in the *Graduate Catalog.*

Department of Agricultural Engineering and Technology

Associate Professor Marvin J. Dvoracek, Chairperson.
Professors Eggenberger, Grub, and Ulich; Associate Professor Foerster; Assistant Professor Dillingham; Lecturer Greiner.

This department supervises the following degree programs: AGRICULTURAL ENGINEERING, *Bachelor of Science in Agricultural Engineering* and *Master of Science in Agricultural Engineering*; and MECHANIZED AGRICULTURE, *Bachelor of Science.* The Agricultural Engineering degree program is jointly administered by the College of Engineering and the College of Agricultural Sciences.

Agricultural engineering is primarily concerned with applying basic engineering principles to the conditions and requirements of agriculture as an industry and as a field of applied science. This responsibility is discharged through teaching and research activities for service to agriculture and by developing and training professional agricultural engineers and agriculture majors in mechanized agriculture.

See the section on the College of Agricultural Sciences for a description of the department and its course offerings. The curriculum for the B.S. degree program in agricultural engineering is given in the accompanying curriculum table.

Agricultural Engineering Curriculum.

FIRST YEAR

Fall		*Spring*	
AG E 1301, Engr. Analysis	3	POLS 2301, Amer. Govt., Org.	3
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. Chem. I (Lab.)	1	CHEM 1104, Prin. Chem. II (Lab.)	1
PSS 1321, Agri. Plant Science	3	E GR 1306, Engr. Graphics I	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	16*		16*

SECOND YEAR

Fall		*Spring*	
AG E 2401, Plane & Topo. Surv.	4	C E 2301, Statics	3
ANSC 3302, Livestock Prod.	3	C E 2210, Proc. Prob. Anal. I	2
MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
PHYS 1308, Prin. of Phys. I	3	PHYS 2301, Prin. of Phys. II	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	PHYS 1106, Prin. of Phys. II (Lab.)	1
Elective (humanity)	3	**POLS 2302, Amer. Pub. Pol.	3
	17	†Elective (technical)	3
			18

THIRD YEAR

Fall		*Spring*	
AG E 3301, Prin. Ag. Mach or M E 3314	3	C E 3305, Mech. of Fluids	3
C E 3302, Dynamics	3	E E 2303, Elec. Sys. Anal.	3
C E 3303, Mech. of Solids	3	M E 3321, Engr. Thermo. I	3
MATH 3350, Math. for Engrs.	3	PSS 2432, Prin. & Pract. Soils or C E 3321 and 3121	4
**HIST 2300, Hist. of U.S. to 1877	3	‡Elective (technical)	3
Elective (humanity)	3		16
	18		

FOURTH YEAR

Fall		*Spring*	
AG E 4100, Seminar	1	Elective (general)	3
**HIST 2301, Hist. of U.S. since 1877	3	#Elective (technical)	12
#Elective (technical)	13		15
	17		

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 133.
*Exclusive of P.E., Band, or ROTC.
**See catalog for other history and political science courses satisfying graduation requirements.
†Must be engineering instrumentation.
‡Must be engineering materials.
#Technical electives for concentration areas as below:

Power and Machinery	Soil and Water	General
AG E 4303, 4304, 4306 M E 4335, 4336 plus 6 hrs. engr. sci. and 4 hrs. engr. des.	AG E 4302, 4307, 4401 C E 3105, 3354, 4355 plus 6 hrs. engr. sci. and 2 hrs. engr. des.	AG E 4303, 4304, 4305, 4306, 4307, 4308, 4401 plus 3 hrs. engr. sci.

Division of Architecture

Professor A. Dudley Thompson, Acting Chairperson.
Professors Calvert, Childers, Garvin, McCutchan, Peng, Robinson, Sasser, and Stewart; Associate Professors Felty, Johnson, Koh, V. M. Thompson, James White, John White, and Williamson; Assistant Professors Davis, Hurt, Lima, Mross, Nelson, Perl, and Peters; Instructor Aranha; Lecturers Cantrell, Kazimee, and Seif.

This division supervises the following degree programs: ARCHITECTURE, *Bachelor of Architecture, Master of Architecture.* At the undergraduate level, students may specialize in either structures or design. The design specialization provides opportunities for concentrations in urban design, architectural history, and historic preservation. The undergraduate degree requirements are given in the accompanying tables. A dual degree is offered with the Department of Civil Engineering.

A common core of design courses applies to all degree plans. Architecture majors are urged to spend summer months working in the offices of registered architects, planners, or associated professional activities.

The Division of Architecture is affiliated with the American Institute of Architects, Association of Collegiate Schools of Architecture, the National Institute of Architectural Education, and Tau Sigma Delta (national honor society in Architecture and Allied Arts).

Emphasis is placed on applied design research, especially on aspects of the unique geographic problems of this locale. The faculty includes individuals with degrees in engineering, psychology, landscape architecture, fine arts, history of architecture, urban design, and city and regional planning. Also, there are members qualified by the Office of Civil Defense for fallout shelter analysis and those trained in documenting and preserving historic structures in cooperation with the Historical American Building Survey.

Degrees in architecture are accredited by the National Architectural Accrediting Board. Many of the faculty are registered architects and hold individual membership in the American Institute of Architects, American Planning Association, Association of Collegiate Schools of Architecture, and Society of Architectural Historians.

The division reserves the right to retain, exhibit, and reproduce work submitted by students. Work submitted for grade is the property of the division and remains such until it is returned to the student.

The division maintains a reference library under the supervision of a trained librarian and receives research material pertinent to design problems in progress at all levels. Reference sources include training aids provided by the Carnegie Foundation, an extensive collection of photographic plates and slides, building materials samples, and manufacturers' data.

Many courses in architecture, especially those in city planning, history of architecture, history of landscape architecture, and architectural freehand drawing, are available as electives to students majoring in other departments. Consent of the instructor may be secured in lieu of the professional prerequisites listed. Students majoring in other academic disciplines may complete a minor in architecture with approval of the departmental chairpersons.

Majors in architecture may not register for work in the advanced undergraduate program which starts with the junior year until certified to be eligible by the department. To qualify for certification a student must have completed the program for the first two years in its entirety with a minimum grade-point average of 2.25. A grade-point average of not less than 2.25 must be maintained in the professional course work. A minimum grade of 2.00 must be maintained in each design course to progress to the next sequence of courses.

Students selecting the structures specialization should do so upon their initial enrollment. A student may elect a design specialization any time prior to completing the three-year core curriculum.

Students transferring from other institutions must submit a portfolio of previous work in architecture and a transcript of completed courses for evaluation and placement. Transfer students will not be admitted to the programs in architecture unless they have a grade-point average of at least 2.25, not less than a 2.50 average in architecture or architecturally related courses, and not less than a 2.25 average for the last semester attended prior to transfer. Admission by transfer to the upper level shall be governed by the requirements listed above.

General electives must be selected on the basis of relevance to the professional degree. Upperclass students will not receive credit for freshman courses other than prerequisites. No credit will be given for physical education, music ensemble, military science, or religion courses.

Architecture Core Curriculum, Design Specialization.

FIRST YEAR

Fall		*Spring*	
ARCH 1331, Intro. to Arch.	3	ARCH 1432, Intro. to Arch. Des.	4
ARCH 1351, Arch. Graphics	3	ARCH 1261, Esthet. I	2
ARCH 1341, Arch. Freehand Draw. I	3	ARCH 1342, Arch. Freehand Draw. II	3
MATH 1320, Coll. Algebra	3	MATH 1321, Trigonometry	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
Elective	3	ARCH 2311, Hist. 19th & 20th Cent.	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	18*		18*

SECOND YEAR

Fall		*Spring*	
ARCH 2431, Arch. Des. II	4	ARCH 2432, Arch. Des. II	4
ARCH 2251, Arch. Tech. I	2	ARCH 2342, Arch. Freehand Draw. IV	3
ARCH 2341, Arch. Freehand Draw. III	3	ARCH 2252, Arch. Tech. II	2
ARCH 2312, Hist. Ancient/Med.	3	ARCH 2313, Hist. Renaissance	3
PHYS 1306, Gen. Physics	3	PHYS 1307, Gen. Physics	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
	16		16

THIRD YEAR

Fall		*Spring*	
ARCH 3431, Arch. Des. III	4	ARCH 3432, Arch. Des. III	4
MET 3319, Environ. Contr. I	3	MET 3320, Environ. Contr. II	3
C E 3380, Struc. Mech. I	3	ARCH 3382, Intro. to City Plan.	3
C S 1302, Intro. Prog. FORTRAN	3	C E 3381, Struct. Mech. II	3
Elective	3	Elective	3
	16		16

FOURTH YEAR

Fall		*Spring*	
ARCH 4331, Arch. Des. IV	3	ARCH 3201, Des. Workshop	2
ARCH 3351, Arch. Struct.	3	ARCH 3352, Arch. Struct.	3
ARCH 4261, Arch. Studies	2	ARCH 4383, Urban Des. I	3
HIST 2300, Hist. of U.S. to 1877	3	C E 4385, Structures	3
Elective	6	HIST 2301, Hist. of U.S. since 1877	3
	—	Elective	3
	17		—
			17

FIFTH YEAR

Fall		*Spring*	
ARCH 4332, Arch. Urban Des.	3	ARCH 4631, Arch. Des. V	6
ARCH 4394, Design Program	3	ARCH 4393, Proj. Plan. & Const. Mgt.	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
ARCH 4311, Prof. Practice	3	Elective	6
Elective	6		—
	—		18
	18		

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 170.
*Exclusive of P.E., Band, or ROTC.

Urban design concentration courses: ARCH 3381, 4281, 4300, 4301, 4333, 4384, ECO 3302.

Architectural history and historic preservation concentration courses: ARCH 2314, 3311, 3354, 4311, 4312, 4313, 4314, 4315.

Architecture Curriculum, Structures Specialization.

FIRST YEAR

Fall		*Spring*	
ARCH 1331, Intro. to Arch.	3	ARCH 1432, Intro. to Arch. Des.	4
ARCH 1351, Arch. Graphics	3	ARCH 1261, Arch. Esthet. I	2
ARCH 1341, Arch. Freehand Draw. I	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1350, Anal. Geom.	3	ARCH 2311, Hist. of 19th & 20th Cent.	3
ENGL 1301, Ess. Coll. Rhetoric	3	ARCH 1342, Arch. Freehand Draw. II	3
C S 1302, Intro. Prog. FORTRAN	3	MATH 1351, Calc. I	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	—		—
	18*		18*

SECOND YEAR

Fall		*Spring*	
ARCH 2431, Arch. Des. II	4	ARCH 2432, Arch. Des. II	4
ARCH 2341, Arch. Freehand Draw. III	3	ARCH 2252, Arch. Tech. II	2
ARCH 2251, Arch. Tech. I	2	PHYS 2301, Prin. Phys. II	3
MATH 1352, Calc. II	3	PHYS 1106, Prin. of Phys. II (Lab.)	1
PHYS 1308, Prin. Phys. I	3	C E 2301, Statics	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	MATH 2350, Calc. III	3
	—		—
	16		16

THIRD YEAR

Fall		*Spring*	
ARCH 3431, Arch. Des. III	4	ARCH 3432, Arch. Des. III	4
MET 3319, Environ. Contr. I	3	MET 3320, Environ. Contr. II	3
C E 3303, Mech. of Solids	3	ARCH 3382, Intro. City Plan.	3
ARCH 2312, Hist. Ancient/Med.	3	ARCH 2313, Hist. Renaissance	3
Elective	3	C E 2210, Proc. in Prob. Anal. I	2
	—	Elective	3
	16		—
			18

FOURTH YEAR

Fall		*Spring*	
ARCH 4331, Arch. Des. IV	3	ARCH 3201, Des. Workshop	2
ARCH 3351, Arch. Struct.	3	ARCH 4383, Urban Des. I	3
C E 3440, Struct. Anal. I	4	ARCH 3352, Arch. Struct.	3
Elective	6	C E 4340, Struc. Anal. II	3
	—	C E 3341, Prin. Struct. Des.	3
	16	Elective	3
			—
			17

FIFTH YEAR

Fall		*Spring*	
ARCH 4391, Prof. Pract.	3	ARCH 4393, Proj. Plan. & Const. Mgt.	3
C E 4343, Des. Concr. Struct.	3	C E 4344, Adv. Struct. Des.	3
C E 3203, Mech. of Solids Lab.	2	C E 3201, Constr. Matls.	2
HIST 2300, Hist. of U.S. to 1877	3	CE 3321, Soil Engr. Sci.	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
C E 4342, Des. Steel Struct.	3	HIST 2301, Hist. of U.S. since 1877	3
	—	C E 3121, Soil Engr. Sci. Lab.	1
	17		—
			18

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 170.
*Exclusive of P.E., Band, or ROTC.

Architecture Curriculum, Urban Design Specialization.

FIRST YEAR

Fall		*Spring*	
ARCH 1331, Intro. to Arch.	3	ARCH 1432, Intro. to Arch. Des.	4
ARCH 1341, Arch. Freehand Draw. I	3	ARCH 1261, Arch. Esthetics I	2
ARCH 1351, Arch. Graphics	3	ARCH 1342, Arch. Freehand Draw. II	3
MATH 1320, Coll. Algebra	3	MATH 1321, Trigonometry	3
ENGL 1301, Ess. Coll. Rhetoric	3	ARCH 2311, Hist. of 19th & 20th Cent.	3
P.E., Band, or ROTC		ENGL 1302, Adv. Coll. Rhetoric	3
	—	P.E., Band, or ROTC	
	15		—
			18

SECOND YEAR

Fall		*Spring*	
ARCH 2431, Arch. Design II	4	ARCH 2432, Arch. Design II	4
ARCH 2341, Arch. Freehand Draw. III	3	ARCH 2342, Arch. Freehand Draw. IV	3
ARCH 2251, Arch. Tech. I	2	ARCH 2252, Arch. Tech. II	2
ARCH 2312, Hist. Ancient/Med.	3	ARCH 2313, Hist. Renaissance	3
PHYS 1306, Gen. Physics	3	PHYS 1307, Gen. Physics	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
	—		—
	16		16

THIRD YEAR

Fall		*Spring*	
ARCH 3431, Arch. Design III	4	ARCH 3432, Arch. Design III	4
MET 3319, Envr. Contr. I	3	MET 3320, Envr. Contr. II	3
C E 3380, Struct. Mech. I	3	C E 3381, Struct. Mech. II	3
ARCH 3381, Community Devel.	3	ARCH 3382, Princ. City Plan.	3
ARCH 3383, Urban Design Theory	3	C S 1362, Fund. Comp. Sci. I	3
	—		—
	16		16

SUMMER

First Term		*Second Term*	
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
ARCH 4481, Planning Res. Docu.	4	ARCH 4333, Des. Prob. in Urban Stu.	3
	7		6

FOURTH YEAR

Fall		*Spring*	
ARCH 4331, Arch. Des. IV	3	ARCH 4383, Urban Des. I	3
ARCH 3351, Arch. Struct.	3	ARCH 3352, Arch. Struct.	3
C E 4385, Structures	3	ARCH 3201, Design Wrkshp.	2
SOC 4362, Urban Community	3	ECO 3302, Eco. of Urban Prob.	3
GEOG 3351, Geog. of Urban Places	3	ENGL 2309, Patt. of Repts.	3
BIOL 2306, Biol. Status of Man	3	PHIL 3331, Phil. of Soc. & Human Sci.	3
	18		17

FIFTH YEAR

Fall		*Spring*	
ARCH 4384, Urban Design II	3	ARCH 4631, Arch. Design V	6
ARCH 4394, Design Program	3	FIN 4336, Urban Land Develop.	3
ARCH 4391, Professional Prac.	3	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3		
POLS 4344, Urban Politics	3		12
	15		

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 172.

Students interested in dual degrees in architecture and civil engineering should follow the curriculum below. Completion of these requirements will result in two accredited degrees — Bachelor of Architecture (structures specialization) and Bachelor of Science in Civil Engineering. Other requirements, including admission and minimum grade-point average, are the same as those for single degrees in each department. Before each registration, the student should consult with the designated advisor in both departments.

Dual-Degree Curriculum, Bachelor of Architecture (Structures Specialization) and Bachelor of Science in Civil Engineering.

FIRST YEAR

Fall		*Spring*	
ARCH 1331, Intro. to Arch.	3	ARCH 1432, Intro. to Arch. Des.	4
ARCH 1341, Arch. Freehand I	3	ARCH 2311, Hist. of 19th & 20th Cent.	3
ARCH 1351, Arch. Graphics	3	C E 1305, Engr. Anal. I	3
MATH 1350, Anal. Geom.	3	MATH 1351, Calc. I	3
HIST 2300, Hist. of U.S. to 1877	3	ARCH 1342, Arch. Freehand II	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	15*		16*

SUMMER SESSION

First Term		*Second Term*	
ENGL 1301, Ess. Coll. Rhet.	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1352, Calc. II	3	MATH 2350, Calc. III	3
	6		6

SECOND YEAR

Fall		*Spring*	
ARCH 2312, Hist. Ancient/Med.	3	ARCH 2432, Arch. Des. II	4
ARCH 2431, Arch. Des. II	4	ARCH 2252, Arch. Tech. II	2
ARCH 2251, Arch. Tech. I	2	PHYS 2301, Prin. Phys. II	3
ARCH 2341, Arch. Freehand III	3	PHYS 1106, Prin. of Phys. II (Lab.)	1
PHYS 1308, Prin. Phys. I	3	C E 2301, Statics	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	ARCH 2313, Hist. Renaissance	3
	16		16

SUMMER SESSION

First Term		*Second Term*	
CHEM 1307, Prin. of Chem. I	3	HIST 2301, Hist. of U.S. since 1877	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	MET 3320, Environ. Contr. II	3
MET 3319, Environ. Contr. I	3		6
	7		

THIRD YEAR

Fall		*Spring*	
ARCH 3431, Arch. Des. III	4	ARCH 3432, Arch. Des. III	4
C E 2210, Proc. in Prob. Anal. I	2	ARCH 3382, Intro. City Plan.	3
MATH 3350, Math. for Engrs. I	3	C E 3303, Mech. of Solids	3
CET 2301, Surveying	3	C E 3305, Mech. of Fluids	3
Elective (approved science)	4	C E 3201, Const. Matls.	2
	16		15

FOURTH YEAR

Fall		*Spring*	
ARCH 4331, Arch. Des. IV	3	ARCH 4383, Urban Des. I	3
ARCH 3351, Arch. Struct.	3	ARCH 3352, Arch. Struct.	3
C E 3440, Struct. Anal. I	4	C E 4340, Struct. Anal. II	3
C E 3210, Proc. Prob. Anal. II	2	C E 3341, Prin. Struct. Des.	3
C E 3371, Pollution Control I	3	C E 3321, Intro. to Geotech. Engr.	3
C E 3130, Civil Engr. Seminar	1	C E 3121, Geotech. Engr. Lab.	1
C E 3203, Mech. of Solids Lab.	2		16
	18		

FIFTH YEAR

Fall		*Spring*	
ARCH 4391, Prof. Pract.	3	ARCH 4393, Proj. Plan. & Const. Mgt.	3
C E 4343, Des. Concr. Struct.	3	C E 4344, Adv. Struct. Design	3
C E 4342, Des. Steel Struct.	3	C E 3272, Water Syst. Anal.	2
C E 3354, Intro. to Hydrology	3	C E 4321 or I E 3322	3
C E 4361, Transp. Engr.	3	E E 2303, Elec. Sys. Anal.	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
	18		17

Admission and progression requirements must meet exact requirements of both departments.
*Minimum hours required, exclusive of P.E., Band, or ROTC — 188.

Courses in Architecture. (ARCH)

Courses designated with an asterisk (*) are open only to architecture majors or to students having permission of the department chairperson.

1261. Architectural Esthetics I (2:2:0). Architecture as a contemporary philosophical concept. Lectures in visual experiences to develop perceptive faculties in the esthetics of architecture.

1331. Introduction to Architecture (3:3:0). An introduction to the architectural profession, its diverse elements and opportunities. University resources examined and curricular opportunities explored in relation to career alternatives.

1341. Architectural Freehand Drawing I (3:0:9). Introduction to drawing. Basic skills and techniques in representational drawing. Translation of three dimensional perception into graphic expression. Outside assignments required.

1342. Architectural Freehand Drawing II — Sketching (3:0:9). Prerequisite: ARCH 1341. Subjects with special interests for the architecture student: the human figure, architectural interiors and exteriors, landscapes and cityscapes. Outside assignments required.

1351. Architectural Graphics (3:0:9). Development of graphic communications through lettering, orthographic drawing, oblique views, axonometrics, measuring point perspectives, and constructed shades and shadows. Theory, practice, and use of instruments emphasized.

1432. Introduction to Architectural Design (4:2:6). Introduction to architecture theories, perceptions, environmental factors, structural concepts, and anthropometrics and architectural design principles and processes with emphasis on three-dimensional concepts.

2251. Architectural Technology I (2:2:0). Study of properties, specifications, and uses of building materials in architecture.

2252. Architectural Technology II (2:2:0). Prerequisite: ARCH 2251. Continuation of ARCH 2251.

2311. History of 19th and 20th Century Architecture (3:3:0). Cultural, technological, and social influences as they determine the development of the 19th and 20th century architecture in Europe and the Americas. Illustrated lectures.

2312. History of Ancient and Medieval Architecture (3:3:0). Architectural contributions of ancient, classic, and medieval civilizations and their relationships to cultural heritage and development of the western world.

2313. History of Renaissance and Baroque Architecture to 1800 (3:3:0). Prerequisite: ARCH 2312. The Renaissance, Baroque, and New Classic architecture of Europe, emphasizing developments essential to the understanding of the background of American and modern architectural growth.

2341. Architectural Freehand Drawing III — Advanced Drawing (3:0:9). Prerequisite: ARCH 1342. Color theory and its use in graphic expression. Mixed media. Outside assignments required.

2342. Architectural Freehand Drawing IV — Presentation (3:0:9). Prerequisite: ARCH 2341. Sequence of presentation techniques. Two and three dimensional studies. Outside assignments required.

***2431. Architecture Design II (4:1:9).** Prerequisite: ARCH 1432; concurrent enrollment or credit in ARCH 2251. Application of theory and principles to physical planning problems emphasizing functional analyses and spatial aspects of architecture.

***2432. Architectural Design II (4:1:9).** Prerequisite: ARCH 2431; concurrent enrollment or credit in ARCH 2252. Continuation of ARCH 2431.

3201. Design Workshop (2:0:6). Prerequisite: ARCH 2432. Project development in architectural design. May be repeated for credit.

3311. Contemporary Residential Architectural Theory (3:3:0). A study and analysis of the trends in twentieth century single family residential architecture in North and South America and Europe. Illustrated lectures.

3312. History of Residential Architecture in the United States (3:3:0). For nonmajors only. A historical survey of the esthetic, technological, economic, and cul-

tural aspects of the styles in American residential architecture with emphasis on single family dwellings. Illustrated lectures.

3313. History of Landscape Design: Baroque/Modern (3:3:0). Historical survey of landscape design from the Baroque period to the present.

3314. History of Texas Architecture (3:3:0). Survey of development of architecture and communities in Texas from Spanish colonial period to mid-twentieth century. Illustrated lectures and documented research.

3351, 3352. Architectural Structures (3:1:6 each). Prerequisite: ARCH 3432, MET 3320. Application of structural theory to specific building requirements, code restrictions, and fabrication limitations. Preparation of details and visits to projects under construction.

3353. Natural Hazards Analysis (3:3:0). Analysis of effects of nuclear, wind, earthquake, fire, and other natural hazards on buildings stressing basic principles of design to shelter people and their environment.

3354. Architectural Conservation (3:3:0). The theory and practice of historic preservation and restoration. New economic uses for nonhistoric old structures.

3361. Introduction to Design Programming (3:3:0). Prerequisite: Junior standing. Seminar formatted exploration of inquiry structured to address complex planning and design problems and search for teleologic paradigms (direction and purpose) of information systems.

3381. Community Development (3:3:0). A study of cities as people, physical structure, pattern, and formative forces; historical, present, and future cities; urbanization processes and systems; environments for living.

3382. Principles of City Planning (3:3:0). Prerequisite: ARCH 2432. Comprehensive background in planning principles which will contribute to a useful understanding of architecture in an urban society and environment.

3383. Urban Design Theory and Urban Places (3:3:0). An examination of distinctive urban places and spaces in cities: urban design theories and principles; context and content; designed places as concept, reality, and images.

***3431. Architectural Design III (4:2:6).** Prerequisite: Completion of second year studies in their entirety. Increasing emphasis upon program research, site analysis, environmental design determinants, architectural materials, and innovative construction methods.

***3432. Architectural Design III (4:2:6).** Prerequisite: ARCH 3431. Continuation of ARCH 3431 with increased emphasis on multi-story construction and building code compliances.

4000. Research in Architecture and Urban Studies (V1-6). Prerequisite: Advanced standing and approval of the department chairperson. Individual studies in advanced architecture, history of architecture, and city planning of special interest. May be repeated for credit.

4261. Architectural Studies Seminar (2:2:0). The study, presentation, and discussion of issues regarding architecture as an aspect of culture and considering the processes and products.

4281. Regional Planning (2:2:0). Prerequisite: Senior standing. Survey of the nature of regional development and planning with emphasis on distinguishing regional characteristics, regional systems of development, developing and underdeveloped countries, and the relationships between definitive urban design and regional planning.

4311. History of Architecture and Art in the Arid Lands of the World (3:3:0). An investigative study of the architecture and art of arid lands, ancient and modern, and the geographic and climatic conditions influencing them.

4312. Pre-Columbian Architecture of Peru, Mexico, and Southwestern United States (3:3:0). Critical evaluation of architecture and culture of Peru, Mexico, and southwestern United States.

4313. Post-Columbian Architecture of Mexico and Southwestern United States (3:3:0). A study of pueblo architecture and Spanish colonial architecture (Texas, New Mexico, Arizona, California).

4314. History of Oriental Architecture (3:3:0). Survey of the great traditions of architecture and the cultural heritage of India, China, and Japan. Emphasis on prehistory through the 18th century.

4315. History of Early American Architecture (3:3:0). Prerequisite: ARCH 2313 and consent of instructor. The American architectural heritage. Pre-Columbian, Southwestern Colonial, regional styles of the eastern seaboard, Western Reserve, and Greek Revival. Illustrated lectures.

***4331. Architectural Design IV (3:0:9).** Prerequisite: ARCH 3432. Emphasis on complex architectural problems and systems; evaluation of environmental considerations.

***4332. Architectural Urban Design (3:0:9).** Prerequisite: ARCH 4383 and 4331. Emphasis on multi-building projects: site planning, transportation-circulation, and contributions of architecture to the urban fabric.

4333. Design Problems in Architecture and Urban Studies (3). Prerequisite: Advanced standing and approval of department chairperson. Individual studies in architecture, history of architecture, and urban design of special interest. May be repeated for credit.

4341. Architectural Sculpture (3:1:6). Problems in modeling, carving, and combined techniques using clay, wood, metal, plaster, and other materials. Plaster-mold making. May be repeated for credit.

4382. Urban Design Notation Workshop (3:1:4). Prerequisite: Senior standing. Graphic and written notational field studies revealing the nature and qualities of actual urban places, spaces, and architecture; interpretations of reality and images.

***4383. Urban Design I (3:0:9).** Prerequisite: ARCH 3382 and senior standing. The theory and problems of city development, community planning, housing, and their solutions under individual criticism.

4384. Urban Design II (3:1:6). Prerequisite: ARCH 4383. Intensification and synthesis of planning concepts developed in Urban Design I. Creating physical design solutions to the environment of man sympathetic to positive values, urban problems, and unique potentials.

4391. Professional Practice (3:3:0). Prerequisite: Senior standing. Study of the architectural profession including organization, ethics, and professional relations for architects.

4392. Architectural Publications (3:1:4). Prerequisite: Senior standing. Mechanics, cost, time requirements, processes of reproduction work through first-hand experience. (Lectures, labs, field trips.)

4393. Project Planning and Construction Management (3:3:0). Prerequisite: ARCH 4331 and 4391. Introduction to network techniques for control of time and cost and to methods of construction supervision for planning, scheduling, and controlling architectural projects.

4394. Design Program (3:3:1). Prerequisite: Approved thesis topic, senior standing. Preliminary study, research, and conferences to develop complete program for terminal problem in ARCH 4631.

4481. Planning Research Documentation (4:2:4). Prerequisite: Senior standing. A practical course stressing research techniques, information gathering, documentation, and analytical processes. Planning programs are developed for actual communities.

***4631. Architectural Design V (6:0:18).** Prerequisite: ARCH 4332 and 4394. Development and design of terminal thesis problem programmed in ARCH 4394.

Department of Chemical Engineering

Professor Steven R. Beck, Chairperson; Associate Professor Hubert R. Heichelheim, Assistant Chairperson.
Professors Bethea, Bradford, Parker, and Tock; Associate Professors Clements, Mann, and Riggs; Assistant Professors Desrosiers, Fischer-Calderon, and Senatore.

This department supervises the following degree programs: CHEMICAL ENGINEERING, *Bachelor of Science in Chemical Engineering, Master of Science in Chemical Engineering, Doctor of Philosophy.* The undergraduate degree requirements appear in the accompanying curriculum table.

The Department of Chemical Engineering has a two-fold purpose. The first is to provide an environment in which students can develop their intellectual capacities, abilities, and interests as fully as possible. The second is to provide professional training in the application of the principles of mass and energy conservation, equilibrium, and rates to the creative resolution of technological problems for the benefit of mankind.

The chemical engineering curriculum is sufficiently general that upon completion the student is prepared for a career in any of the process industries which involve chemical transformations. Employment opportunities cover a wide spectrum which includes, among others, refineries, plastics production, pharmaceuticals, metal production, textiles, as well as biomedical and biological specialities. Many chemical engineers are directly involved in the design of systems to minimize the pollutants emitted to our environment.

In order to be prepared for professional training as well as to practice chemical engineering professionally, it is essential that the prospective engineer have a good background in the physical sciences, namely mathematics, physics, and chemistry, in addition to the engineering sciences which include basic civil, electrical, and chemical engineering. Summer experience in a chemical processing industry is strongly recommended as part of the preparation for professional practice. In order to illustrate the application of engineering principles, visits to processing installations may be required.

Before enrolling in CH E 3322 and/or CH E 3426, a student must petition the department for approval. A 2.00 grade-point average or better is required in MATH 1350, 1351, 1352, 2350, 3350, CHEM 1307, 1308, C E 2301, PHYS 1308, and 2301, with a grade of C or better in CH E 2411. The most recent grade received in each of these courses is used to determine if these requirements are satisfied.

Chemical Engineering Curriculum.

FIRST YEAR*

Fall		*Spring*	
*MATH 1551, Anal. Geom. & Calc. I	5	*MATH 1552, Anal. Geom. & Calc. II	5
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	CHEM 1104, Prin. of Chem. II (Lab.)	1
CH E 1305, Engr. Anal. I	3	PHYS 1308, Prin. of Phys. I	3
P.E., Band, or ROTC		PHYS 1105, Prin. of Phys. I (Lab.)	1
		P.E., Band, or ROTC	
	15†		16†

SUMMER

First Term		*Second Term*	
**Soc. Sci.-Hum.	6	**Soc. Sci.-Hum.	6
	6		6

SECOND YEAR

Fall		*Spring*	
MATH 2350, Calc. III	3	MATH 3350, Math. for Engr. I	3
PHYS 2301, Prin. of Phys. II	3	CHEM 3307, Physical Chem. I	3
PHYS 1105, Prin. of Phys. II (Lab.)	1	CHEM 3107, Phys. Chem. I (Lab.)	1
CHEM 3305, Org. Chem. I	3	C E 2301, Statics	3
CHEM 3105, Org. Chem. I (Lab.)	1	CH E 3425, Trans. Phen. I	4
CH E 2411, Process Prin.	4	CH E 3321, Chem. Engr. Thermo. I	3
	15		17

THIRD YEAR

Fall		*Spring*	
‡Advanced chemistry	4	‡Advanced chemistry	4
#Advanced mathematics	3	E E 2303, Elect. Sys. Anal.	3
CH E 3330, Engr. Materials Sci.	3	CH E 3441, Mass Trans. Oper.	4
CH E 3322, Chem. Engr. Thermo. II	3	CH E 4323, Chem. React. Engr.	3
CH E 3426, Trans. Phen. II	4	CH E 4353, Process Control	3
	17		17

FOURTH YEAR

Fall		*Spring*	
CH E 4153, Process Control Lab.	1	CH E 4121, Chem. Engr. Seminar	1
CH E 4232, Unit Oper. Lab. I	2	CH E 4233, Unit Oper. Lab. II	2
CH E 4354, Chem. Engr. Plant Des.	3	CH E 4355, Chem. Engr. Plant Des. II	3
Engr. Sci. elective	3	Engr. Sci. elective	3
**Soc. Sci.-Hum.	3	**Soc. Sci.-Hum.	3
Elective	3	Elective	3
	15		15

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 139.
*MATH 1350, 1351, 1352 may be substituted for MATH 1551, 1552, in which case minimum hours required for graduation is 138.
**Social sciences-humanities must include 6 semester hours of American history and 6 hours of American government or approved equivalent.
†Exclusive of P.E., Band, or ROTC.
‡Must be taken from approved chemistry courses numbered CHEM 2501 or greater.
#Must be taken from MATH 2360, 3351, 3360, or approved senior-level courses.

Courses in Chemical Engineering. (CH E)

1305. Engineering Analysis I (3:3:0). Corequisite: MATH 1551 or 1351. The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. FORTRAN programming. Synthesis and analysis of typical engineering problems.

2411. Process Principles (4:4:0). Prerequisite: CH E 1305, CHEM 1308, PHYS 1308, 1105; corequisite: MATH 1552 or 1352. Material and energy balances for engineering systems subjected to chemical or physical transformations.

3321. Chemical Engineering Thermodynamics I (3:3:0). Prerequisite: CH E 2411 or departmental approval; corequisite: MATH 2350. Application of the principles of thermodynamics to physical and chemical processes. Forms of energy, First and Second Laws, properties of pure materials, power cycles, refrigeration, and liquefaction.

3322. Chemical Engineering Thermodynamics II (3:3:0). Prerequisite: CH E 3321; corequisite: MATH 3350. Solution thermodynamics, phase and chemical equilibria, compressible flows, analysis of processes.

3330. Engineering Materials Science (3:3:0). Prerequisite: CHEM 1308. The engineering properties of metals, ceramics, and polymers are described in terms of molecular, crystal, and microstructure configurations. This information is then used to explain the selection of various materials for particular applications.

3425. Transport Phenomena I (4:3:3). Prerequisite: CH E 2411, C E 2301; corequisite: MATH 3350, CH E 3321, or consent of instructor. A unified treatment of momentum, heat, and mass transport using shell balances and the equations of change to solve problems in isothermal, nonisothermal, and multicomponent systems.

3426. Transport Phenomena II (4:3:3). Prerequisite: CH E 3425. Molecular diffusion, convective mass transfer, interphase mass transfer, convective mass-transfer correlations, conduction heat transfer, boiling and condensation, heat-transfer equipment, radiation heat transfer.

3441. Mass-Transfer Operations (4:3:3). Prerequisite: CH E 3322 with a grade of C or better or approval of the department. Theory and practice of mass transfer. Particular emphasis will be placed on the operations of distillation, absorption, and extraction.

4121. Chemical Engineering Seminar (1:1:0). Prerequisite: Advanced standing and approval of the department chairperson. Group discussion of current events, chemical engineering education, professionalism, as well as individual prepared talks. Field trips, as necessary, will be scheduled. May be repeated for credit.

4153. Process Control Laboratory (1:0:3). Prerequisite: CH E 4353. Experiments with control equipment and the minicomputer.

4232. Unit Operations Laboratory I (2:0:6). Prerequisite: CH E 3441, 3426. Laboratory experiments illustrating the basic principles of unit operations. Includes instruction on experimental methods, equipment scale up, and technical communication.

4233. Unit Operations Laboratory II (2:0:6). Prerequisite: CH E 4232. Laboratory experiments on combined unit operations. Includes instruction on design and scale up of equipment and technical communications.

4323. Chemical Reaction Engineering (3:3:0). Prerequisite: CH E 3322, 3426, CHEM 3307. An introduction to the kinetics of chemical conversion processes and the design of chemical reactors.

4331. Special Problems in Chemical Engineering (3). Prerequisite: Advanced standing and approval of department chairperson. Individual studies in advanced engineering areas of special interest. May be repeated for credit.

4332. Special Experimental Problems in Chemical Engineering (3). Prerequisite: Advanced standing and approval of department chairperson. Individual experimental studies in an area of special interest to student. May be repeated for credit.

4333. Engineering Aspects of Energy Resources, Processing, and Utilization (3:3:0). Prerequisite: Junior standing in engineering, engineering technology, physical science, or mathematics. The engineering aspects of energy use from all potentially available energy sources are presented. Topics include amounts of energy available, its cost, and associated pollution problems; processes used to prepare clean, convenient fuels and energy conservation methods; and the effect of government regulations and public opinion on the cost and availability of energy.

4342. Polymer Science and Technology (3:3:0). Prerequisite: CHEM 3305. Theory of macromolecular structures and the relation of properties to structure. The manufacture and application of polymeric materials.

4343. Engineering Experimentation (3:3:0). Prerequisite: Junior standing in physical science or engineering. Strategy in experimentation; planning efficient experiments; analysis of data and presentation of results.

4353. Process Control (3:3:0). Prerequisite: CH E 3426; corequisite: MATH 3350. Study of the principles of process dynamics and control and their applications to feedback control.

4354. Chemical Engineering Plant Design (3:2:3). Prerequisite: CH E 3426, 3441; corequisite: CH E 4323, 4353, or consent of instructor. Development of process and equipment designs for integral manufacturing plants.

4355. Chemical Process Design and Simulation (3:2:3). Prerequisite: CH E 4354. Application of computer simulation and flowsheeting, optimization, and process synthesis techniques to the design of chemical processes and equipment.

4360. Industrial Waste Treatment (3:3:0). Prerequisite: CHEM 1308, MATH 1352. Introduction to the sources and effects of industrial water pollution; stream and plant surveys; sampling and analytical procedures; principles and application of physical, chemical, and biological processes used in reducing or eliminating water pollution.

Department of Civil Engineering

Professor Ernst W. Kiesling, Chairperson.

Professors Lee, McDonald, Mehta, Minor, Smith, and Sweazy; Associate Professors Claborn, Keho, Ramsey, Urban, Vallabhan, and Vann; Assistant Professors Norville and Wray.

This department supervises the following degree programs: CIVIL ENGINEERING, *Bachelor of Science in Civil Engineering, Master of Science in Civil Engineering,* and *Doctor of Philosophy.* The undergraduate requirements are given in the accompanying curriculum table.

The objective of civil engineering education is to prepare a graduate who is sensitive and alert to the needs of society, who has developed a professional engineering outlook, and who is equipped with the technical competence and creativeness to do something significant to meet society's needs. A student graduating with a degree in civil engineering will possess competence in the following areas with a modest concentration in at least one of them: environmental and water resource engineering, design of structures, geotechnical engineering.

A minimum grade of C is required in C E 2301, 3303, 3305, and 3371 before registering for a course for which these are prerequisite.

Students interested in obtaining both the Bachelor of Science in Civil Engineering and the Bachelor of Architecture degrees should refer to the dual-degree curriculum listed in the "Division of Architecture" section of this catalog.

Civil Engineering Curriculum.

FIRST YEAR

Fall		*Spring*	
MATH 1350, Anal. Geom.	3	MATH 1351, Calc. I	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
C E 1305, Engr. Anal. I	3	CET 2301, Surveying	3
E GR 1306, Engr. Graphics	3	HIST 2300, Hist. of U.S. to 1877	3
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	CHEM 1104, Prin. of Chem. II (Lab.)	1
P.E., Band, or ROTC		P.E., Band, or ROTC	
	16†		16†

SECOND YEAR

Fall		*Spring*	
MATH 1352, Calc. II	3	MATH 2350, Calc. III	3
PHYS 1308, Prin. of Phys. I	3	PHYS 2301, Prin. of Phys. II	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	PHYS 1106, Prin. of Phys. II (Lab.)	1
POLS 2301, Amer. Govt., Org.	3	C E 3371, Pollution Contr.	3
C E 2301, Statics	3	C E 3303, Mech. of Solids	3
HIST 2301, Hist. of U.S. since 1877	3	C E 2210, Proc. Prob. Anal. I	2
	16		15

SUMMER SESSION

First Term		*Second Term*	
E E 2303, Elec. Sys. Anal.	3	C E 3305, Mech. of Fluids	3
C E 3210, Proc. Prob. Anal. II	2	C E 3302, Dynamics	3
	5		6

THIRD YEAR

Fall		*Spring*	
C E 3440, Struc. Anal. I	4	C E 3272, Water Sys. Anal.	2
C E 3354, Intro. to Hydrology	3	C E 3341, Prin. of Struc. Des.	3
C E 3105, Mech. of Fluids Lab.	1	C E 3201, Construction Matls.	2
M E 3321, Thermodynamics	3	C E 3321, Intro. Geotech. Engr.	3
MATH 3350, Math. for Engrs. I	3	C E 3121, Geotech. Engr. Lab.	1
**Elective (science)	3	C E 3130, C.E. Seminar	1
		†Elective (technical)	5
	17		17

FOURTH YEAR

Fall		*Spring*	
C E 4361, Transp. Engr.	3	†Elective (technical)	6
†Elective (technical)	9	Elective (humanity)	6
POLS 2302, Amer. Pub. Pol.	3		
	15		12

Minimum hours required for graduation, exclusive of P. E., Band, or ROTC — 135.
MATH 1551 and 1552 may be taken in lieu of MATH 1350, 1351, and 1352.
*See Alternate Freshman Year.
**The science elective must be one of the following: GEOL 2303, BIOL 1401 or 1402, ATMO 3301, PSS 2432.
†Technical electives to be selected as follows: 6 hours of engineering science from CH E 3330 or M E 3341, E E 2304, I E 3322, 3342; 8 hours in one of the following concentration areas:

Structures	Water Resources	Geotechnical
C E 3203	C E 3271	C E 3203
C E 4340	C E 4357	C E 4321
C E 4342 or 4343	C E 4353 or 4371	C E 4343

and 6 hours from any concentration area or from the following: C E 4330, 4344, 4354, 4355, 4392, CHEM 3401, MBIO 3400, CH E 4360, AG E 4302.

Courses in Civil Engineering. (C E)

1305. Engineering Analysis I (3:3:0). The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. FORTRAN programming. Synthesis and analysis of typical engineering problems.

2210. Procedures of Problem Analysis I (2:2:0). Prerequisite: MATH 1352, FORTRAN. Application of selected problem solving techniques to civil engineering problems.

2301. Statics (3:3:0). Corequisite: MATH 1352. Equilibrium of particles and rigid bodies, friction, centroids, and moments of inertia.

3105. Mechanics of Fluids Laboratory (1:0:3). Prerequisite: C E 3305. Experimental studies of fluid behavior.

3121. Geotechnical Engineering Laboratory (1:0:3). Prerequisite: Concurrent enrollment in C E 3321. Laboratory determination and engineering evaluation of the physical properties of soils.

3130. Civil Engineering Seminar (1:0:2). Study of concepts of professionalism, engineering practice, and effectiveness of oral and written communications.

3201. Construction Materials (2:1:3). Studies concerning the physical properties of construction materials.

3203. Mechanics of Solids Laboratory (2:1:3). Prerequisite: C E 3303. Analytical and experimental studies of material behavior under various loading conditions.

3210. Procedures of Problem Analysis II (2:2:0). Corequisite: C E 2210. Application of selected basic and advanced problem solving techniques.

3271. Pollution Control Laboratory (2:1:3). Prerequisite: C E 3371, CHEM 1308. Introduction to physical, chemical, and biological methods for assessing the quality of water and wastewater.

3272. Water System Analysis (2:2:0). Prerequisite: C E 3305; corequisite: C E 3105, 3354. Hydraulic analysis of water distribution, storm water collection, and wastewater collection systems.

3302. Dynamics (3:3:0). Prerequisite: C E 2301. A study of motions of particles and rigid bodies.

3303. Mechanics of Solids (3:3:0). Prerequisite: C E 2301. Theory of stress and strain in elastic and inelastic bodies subject to various conditions of loading.

3305. Mechanics of Fluids (3:3:0). Prerequisite: C E 2301. Hydrostatics; dynamics of viscous and nonviscous fluids; resistance to flow; flow in pipes and open channels.

3321. Introduction to Geotechnical Engineering (3:3:0). Prerequisite: C E 3303, concurrent registration in C E 3121. Physical properties of soils; theories of soil strength, consolidation, and settlement; soil stabilization; slope stability analysis.

3341. Principles of Structural Design (3:3:0). Prerequisite: C E 3440. Fundamental principles of structural design with consideration for the selection of materials.

3354. Introduction to Hydrology (3:3:0). Prerequisite: C E 3305, 3210. An introduction to the occurrence and distribution of surface and groundwater; precipitation, infiltration, runoff, frequency analysis.

3371. Pollution Control I (3:3:0). Prerequisite: CHEM 1308. An introduction to water and wastewater treatment principles, processes, and operations.

3380. Structural Mechanics I (3:3:0). Prerequisite: MATH 1321. Statics for students of architecture: history, urban, or design option.

3381. Structural Mechanics II (3:3:0). Prerequisite: C E 3380. Mechanics of solids for students of architecture: history, urban, or design option.

3440. Structural Analysis I (4:3:3). Prerequisite: C E 3303. Introduction to the analysis of statically determinate and indeterminate structures.

4131. Special Studies (1). Individual study of engineering problems of special interest and value to the student.

4321. Geotechnical Engineering Design (3:3:0). Prerequisite: C E 3321. Site investigation, soil improvement, bearing capacity, settlement analysis, lateral earth pressure, spread footings, pier and pile foundations, retaining walls.

4330. Design of Engineering Systems (3:3:0). Prerequisite: Senior standing and consent of instructor. Interdisciplinary approach to the design of complex engineering systems.

4331. Special Problems in Civil Engineering (3). Individual studies in advanced engineering areas of special interest. May be repeated for credit.

4333. Special Problems in Water Resources (3). Individual studies in water resources. May be repeated for credit.

4340. Structural Analysis II (3:3:0). Prerequisite: C E 3440 and 2210 or equivalent. The analysis of structures by classical and matrix methods.

4342. Design of Steel Structures (3:3:0). Prerequisite: C E 3341. An advanced course in structural steel design. Includes principles of elastic and plastic design methods.

4343. Design of Concrete Structures (3:3:0). Prerequisite: C E 3341. An advanced course in reinforced concrete design. Includes prestressed concrete structures.

4344. Advanced Structural Design (3:2:3). Prerequisite: C E 4342 or 4343. Structural design projects using the design team approach.

4353. Elements of Hydraulics Engineering (3:3:0). Prerequisite: C E 3272. Nonuniform flow in open channels, energy dissipation devices, open channel flow control devices, pump selection, unsteady flow in pipes.

4354. Advanced Hydrology (3:3:0). Prerequisite: C E 3354. Current practice in hydrology including flood plain delineation, runoff determination, watershed simulation.

4355. Ground Water Hydrology (3:3:0). Prerequisite: C E 3354. Infiltration; flow of underground water under confined and unconfined conditions; development of ground water supplies, recharge of ground water reservoirs.

4357. Design of Water Resource Systems (3:2:3). Prerequisite: C E 3272 and consent of instructor. Team approach to design of water supply, treatment, and distribution systems.

4361. Transportation Engineering (3:3:0). Prerequisite: Senior standing or approval of instructor. Comparison of various modes of transportation, basic concepts involved in highway, airport, railroad, and waterborne modes.

4371. Pollution Control II (3:3:0). Prerequisite: C E 3305, 3371. Introduction to engineering approaches to environmental problems in air, water, and soil systems.

4385. Structures (3:3:0). Prerequisite: C E 3381. Studies of steel, reinforced concrete, and timber structures for students of architecture: history, urban, or design option.

4391. The Relationship of Technology to Society (3:3:0). Prerequisite: 3.0 GPA or consent of instructor. A survey of modern technology and its effect on man's society.

4392. Law and Ethics in Engineering (3:3:0). Prerequisite: Senior standing in engineering or approval of department chairperson. Professional and industrial problems, contracts, specifications, ethics of engineering.

Department of Electrical Engineering

Horn Professor Marion O. Hagler, Acting Chairperson; Professor Kwong S. Chao, Associate Chairperson.

Horn Professor Kristiansen; Professors Archer, Craig, Portnoy, Reichert, Seacat, Vines, and Walkup; Associate Professors Emre, Gustafson, Hennessey, Krile, Kunhardt, Murray, O'Hair, Schaefer, Schoenbach, Stenis, Trost, Weiner, and Williams; Assistant Professors Gadia, Hardwick, Lakhani, Lombardi, Nakijima, and Su; Lecturer Simpson; Visiting Assistant Professor Krompholz.

This department supervises the following degree programs: ELECTRICAL ENGINEERING, *Bachelor of Science in Electrical Engineering, Master of Science in Electrical Engineering, Doctor of Philosophy;* COMPUTER SCIENCE, *Bachelor of Science, Master of Science, Doctor of Philosophy.* An 18-hour minor in computer science is offered for students majoring in other areas.

Students entering the electrical engineering program will be assigned a faculty advisor and will be responsible for arranging a course of study with the advisor's advice and approval. All students enrolled in this program will be required to maintain a grade-point average of at least 2.00 in their major field during each

semester. A student who receives two or more Ds in major courses in one semester must retake those courses in which the Ds were made. A student who fails to meet this requirement in any given semester must fulfill a program outlined by the faculty advisor before being allowed to proceed.

To be admitted to junior standing as an electrical engineering major, a student must submit a petition to the department prior to registering for the third year; its acceptance depends upon the student's grade record which should reflect an overall grade-point average of 2.00, above-average grades in mathematics courses, and a C or better in both E E 2301 and 2302. All elective courses must have departmental approval.

The undergraduate program in computer science is designed to provide a solid background for every student and an opportunity for each to gain practical experience in an area of particular interest. The scope and flexibility of the curriculum enables the program to meet the goals of those students who are preparing for a career immediately after graduation as well as those who expect to go on for a graduate degree in computer science.

Students enrolled in the computer science program must meet the following minimum academic standards in order to remain in good standing: earn a C or better in C S 1362 and 1363 and maintain a cumulative grade-point average of 2.00 in all required mathematics courses. A student who fails to remain in good standing must fulfill a special program specified by the computer science undergraduate advisor before being allowed to continue in the regular program.

All minor and elective courses in the computer science curriculum must have departmental approval.

Electrical Engineering Curriculum.

FIRST YEAR

Fall		*Spring*	
MATH 1551, Anal. & Calc. I	5	MATH 1552, Anal. & Calc. II	5
CHEM 1307, Prin. of Chem. I	3	PHYS 1308, Prin. of Phys. I	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	PHYS 1105, Prin. of Phys. I (Lab.)	1
E E 1305, Engr. Anal. I	3	E GR 1306, Engr. Graphics	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	18*		18*

SECOND YEAR

Fall		*Spring*	
MATH 2350, Calculus III	3	E E 2371, Anal. Tech.	3
MATH 3350, Math. for Engrs. I	3	E E 2302, Prin. of Elect. Engr. II	3
PHYS 2301, Prin. of Phys. II	3	E E 3311, Electronics I	3
PHYS 1106, Prin. of Phys. II (Lab.)	1	E E 3231, Measurements Lab.	2
E E 2301, Prin. Elect. Engr. I	3	C E 2301, Statics	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
	16		17

THIRD YEAR

Fall		*Spring*	
E E 3232, Exp. Lab. IA	2	E E 3361, Elect. & Mag. Prop.	3
E E 3323, Meth. of Circ. Anal.	3	E E 3342, Electromag. Theory II	3
E E 3341, Electromag. Theory I	3	E E 3233, Experimental Lab. IB	2
E E 3312, Electronics II	3	C S 4372, Analog & Dig. Comp.	3
E E 4351, Energy Convr. I	3	E E 4353, Feedback Contr. Sys.	3
M E 3321, Engr. Thermo.	3	Elective (humanity)	3
	17		17

FOURTH YEAR

Fall		*Spring*	
E E 4333, Experimental Lab. II	3	E E 4332, Spec. Exp. Prob.	3
†Elective (technical)	9	†Elective (technical)	6
Elective (humanity)	3	‡Elective	6
	15		15

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 133.
MATH 1350, 1351, and 1352 may be taken in lieu of MATH 1551 and 1552.
*Exclusive of P.E., Band, or ROTC.
†At least two technical electives must be in other engineering disciplines.
‡At least one elective must be in a basic science. Possible electives include PHYS 3301, 4304, 4305; CHEM 1308, 1104, GEOL 2303, 3303; and BIOL 1401, 1402.

Computer Science Curriculum.

FIRST YEAR

Fall		*Spring*	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
†MATH 1350, Anal. Geom.	3	†MATH 1351, Calculus I	3
C S 1362, Fund. Comp. Sci. I	3	C S 1363, Fund. Comp. Sci. II	3
Lab. science	4	Lab. science	4
Humanities elective	3	Humanities elective	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	*16		*16

SECOND YEAR

Fall		*Spring*	
†MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
C S 2351, Info. Structures	3	C S 3350, Comp. Org. & Assy. Lang.	3
C S 2372, Intro Comp. Logic	3	HIST 2301, Hist. of U.S. since 1877	3
HIST 2300, Hist. of U.S. to 1877	3	‡E E 2303, Elec. Sys. Anal.	3
Free elective	3	Minor	3
	15		15

THIRD YEAR

Fall		*Spring*	
**Computer science elective	3	**Computer science elective	3
C S 3372, Logic Lab.	3	Minor	6
E E 2304, Electronic Inst.	3	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3	C S 3375, Mach. Struc. & Org.	3
Minor	3	C S 3352, Systems Prog.	3
	15		18

FOURTH YEAR

Fall		*Spring*	
••Computer science elective	6	••Computer science elective	9
Minor	3	Minor	3
Free elective	6	C S 4331, Spec. Top. in C.S.	3
C S 4331, Spec. Top. in C.S.	3		
	18		15

Minimum hours for graduation, exclusive of P.E., Band, or ROTC — 128.
†MATH 1551 and 1552 may be substituted for MATH 1350, 1351, and 1352.
*Exclusive of P.E., Band, or ROTC.
••Up to 6 hours of interdisciplinary courses may be substituted for computer science electives with the consent of the computer science undergraduate advisor.
‡E E 2301 and 2302 may be substituted for E E 2303 and 2304.

Courses in Electrical Engineering. (E E)

1305. Engineering Analysis I (3:3:0). The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. FORTRAN programming. Synthesis and analysis of typical engineering problems. Introduction to computer logic.

2301, 2302. Principles of Electrical Engineering I, II (3:3:0 each). Corequisite: MATH 1552 for E E 2301, and MATH 2350 and 3350 or approval of department chairperson for E E 2302. Principles of electric and magnetic circuits. Induced and generated electromotive force. Forces on conductors. Fundamentals of alternating current circuits. Fundamentals of resistance, inductance, and capacitance.

2303. Electrical System Analysis (3:2:2). Corequisite: MATH 2350. Steady state circuit analysis, network theorems, use of meters, diodes, and rectifier circuits.

2304. Electronic Instrumentation (3:2:2). Prerequisite: E E 2303. Transistor and vacuum tube amplifiers, sensing and comparison devices used in instrumentation, energy conversion and control devices, analog computers.

2344. Instrumentation and Automation for Chemical Systems (3:3:0). Prerequisite: E E 2303. Introduction to measurement practices and application of several types of transducers. Communication networks including telephone and microwave with necessary signal conditioning circuits. Discussion of computers and their applications in process control. Survey of actual computer-controlled systems.

2371. Analytical Techniques for Solutions of Electrical Engineering Problems (3:3:0). Prerequisite: MATH 3350. Analytical techniques applied to electrical engineering problems.

3231. Measurements Laboratory (2:0:6). Corequisite: E E 2302. Detailed experimental study of the measurement problem. Use of test equipment and measurement devices.

3232, 3233. Experimental Laboratory IA, IB (2:0:6 each). Prerequisite: E E 3231, 3311. A laboratory course to accompany third-year basic courses in electrical engineering.

3311. Electronics I (3:3:0). Corequisite: E E 2302. Introduction to modeling of electronic devices. Principles of elementary electronic circuit design and analysis.

3312. Electronics II (3:3:0). Prerequisite: E E 3311. Vacuum tube and transistor amplifiers, oscillators, modulators, demodulators, frequency converters, and wave-shaping circuits.

3323. Methods of Circuit Analysis (3:3:0). Prerequisite: E E 2302, 2371. Spectral analysis of periodic and nonperiodic signals using Fourier series and integrals. Study of the inversion integral.

3341. Electromagnetic Theory I (3:3:0). Prerequisite: E E 2371. General treatment of static electric and magnetic fields from the vector viewpoint.

3342. Electromagnetic Theory II (3:3:0). Prerequisite: E E 3341. General solutions for Maxwell's equations. Traveling waves in scalar media. Boundary conditions and constraints imposed by bounding surfaces.

3361. Electric and Magnetic Properties of Materials (3:3:0). Prerequisite: E E 3341. Structure of crystals. Application of diffraction techniques. Application to semiconducting materials. Electrical processes in dielectrics.

4121. Electrical Engineering Seminar (1). Prerequisite: Advanced standing and approval of department chairperson. Individual study of engineering problems of special interest and value to the student. May be repeated for credit in different areas.

4315. Biomedical Instrumentation (3:3:0). Principles of transducers. External and implantable electrodes. Bioelectric phenomena. Respiration, blood flow. Electrocardiography, plethysmography, encephalography, muscular activity.

4317. Electronics III (3:3:0). Prerequisite: E E 3312. Advanced methods in the analysis and design of electronic circuits. Detailed study of specialized circuits and their integration into functional systems.

4318. Physical Electronics (3:3:0). Prerequisite: E E 3361. Introductory study of the physical properties of electron devices; electron ballistics, thermionic emission, conduction through gases and solids.

4331. Special Problems in Electrical Engineering (3). Prerequisite: Approval of department chairperson. Individual studies in advanced engineering areas of special interest. May be repeated for credit.

4332. Special Experimental Problems in Electrical Engineering (3). Prerequisite: E E 4333. Individual experimental studies in current problems in advanced engineering technology of special interest.

4333. Experimental Laboratory II (3:0:9). Prerequisite: E E 3233, 3341. A laboratory course to accompany fourth-year courses in electrical engineering. Projects assigned to correlate the theory presented in first-semester senior courses.

4341. Microwave Systems (3:3:0). Prerequisite: E E 3342. The wave equation and its solution in guiding systems. Discontinuities and impedances in waveguides. Microwave resonators.

4343. Energy Transmission (3:3:0). Prerequisite: Senior standing in electrical engineering. Theory and application of transmission lines at power, signal, and high frequencies.

4344. Introduction to Pulsed Power Design (3:3:0). Prerequisite: E E 3342, 3323, 3312. Design considerations for pulsed power systems including components, switching, capacitive and inductive energy storage, PFN design, and grounding and shielding procedures.

4351. Energy Conversion I (3:3:0). Prerequisite: E E 2302. Elements of energy conversion applied to direct current and alternating current static and rotating machinery.

4352. Direct Energy Conversion (3:3:0). Prerequisite: E E 3361. Thermoelectric, photoelectric, and thermionic converters, magnetohydrodynamic and electrogasdynamic generators. Fuel cells. Nuclear energy conversion and reactor theory.

4353. Feedback Control Systems (3:3:0). Prerequisite: E E 3312, 3323. An introduction to the theory of automatic control systems. Flowgraphs and block diagrams. Stability criteria. Prediction of closed-loop time response. System compensation. Components.

4354. Acoustics. (3:3:0). Prerequisite: Senior standing in engineering. General nature of the acoustics problem. Radiating systems. Dynamical analogies. Microphones and other transducers. Acoustic measurements.

4357. Nuclear Power Generation (3:3:0). Fuel processing, reactor components, modified one group reactor theory, pressurized and boiling water reactors, high temperature gas cooled reactors, breeder reactors, siting and licensing considerations, reactor safety, controlled thermonuclear fusion.

4360. Probabilistic Signal and System Analysis (3:3:0). An introduction to probabilistic methods, as applied in signal and system analysis. Basic probability theory, random variables, random processes, correlation functions, and power spectral densities. Applications include the responses of systems to random inputs and systems optimization in the presence of noise.

4361. Introduction to Information Theory and Noise (3:3:0). Prerequisite: Senior standing in electrical engineering. Information transmission in electronic systems; modulation, demodulation, frequency conversion, multiplexing, probability fundamentals, noise and noise spectra; spectrum, envelope, and instantaneous frequency relations; quantization techniques.

4362. Modern Optics for Engineers (3:3:0). Prerequisite: Senior standing in engineering. Modern concepts in optics related to engineering applications. Geometrical, physical, and quantum optics; Fourier optics, holography, and image processing.

4363. Feedback Control Systems II (3:3:0). Prerequisite: E E 4353. An introduction to the time domain methods of control. State space representation of linear systems, time domain stability, the concepts of controllability and observability. Time domain control system design techniques, including pole placement, detector design, and an introduction to linear optimal control.

4364. Digital Signal Processing (3:3:0). Prerequisite: E E 3323. An introduction to digital signal processing. Sampling, z-transform, discrete and fast Fourier transforms, flowgraphs, design techniques for digital filters, effects of finite wordlength, and applications.

4381. Integrated Circuits (3:3:0). Theory of fabrication of diodes, transistors, capacitors, resistors into functional arrays. Distributed R-C networks. Linear and digital functional blocks.

Courses in Computer Science. (C S)

1300. Computers and Modern Society (3:3:0). Survey of the widespread uses and impact of computers in society. Brief introduction to computer programming. Credit may not be applied toward a computer science major or minor.

1301. Introductory Programming with COBOL (3:3:0). Prerequisite: Satisfactory placement test scores or equivalent of MATH 1320 and 1321. A first course in programming; contents similar to C S 1302, but with COBOL. Credit not given for both C S 1301 and 1302.

1302. Introductory Programming with FORTRAN (3:3:0). A first course in computer programming. Credit will not be given for both C S 1301 and 1302.

1362. Fundamentals of Computer Science I (3:3:0). Prerequisite: Satisfactory placement test scores or the equivalent of MATH 1320 and 1321. A first course for computer science majors or minors. Introduction to digital computers and digital computing, machine structure and instructions, algorithmic processes, problem-solving methods, flowlists and flowcharts, programming styles. Programming languages PL/I and PL/C.

1363. Fundamentals of Computer Science II (3:3:0). Prerequisite: C S 1362. Concepts of programming languages. Procedures, data objects, language implemented storage structures, scopes of names, iterations, recursion. Languages examined will include FORTRAN, PASCAL, LISP, and ALGOL.

2351. Information Structures (3:3:0). Prerequisite: C S 1363. Information structures; trees, data processes for managing secondary storage; introduction to large scale computing; records, files, access methods. Programming languages: PL/I and COBOL.

2372. Introduction to Computer Logic (3:3:0). Prerequisite: C S 1362. Introduction to stored program computers; logic design, combinatorial and sequential circuits; register arithmetic and its implementation. Study of the organization, architecture, and instruction set for an elementary microcomputer.

3350. Computer Organization and Assembly Language Programming (3:3:0). Prerequisite: C S 1363. Computer organization and assembly language programming, system and data management macros. Mini and microcomputer assembly languages.

3352. Systems Programming Laboratory (3:0:9). Prerequisite: C S 2351, 3350. Software laboratory in which students are assigned independent study projects. Topics include assemblers, link-editors, loaders, monitors, interrupt processors, I/O routines, etc.

3361. Concepts of Programming Languages (3:3:0). Prerequisite: C S 2351 or 3350 or concurrent enrollment. Study of the syntax, semantics, structure, and design of various programming languages such as PL/I, FORTRAN, ALGOL, COBOL, SNOBOL, APL, and LISP.

3363. Software Design (3:3:0). Prerequisite: C S 3350. Software design, engineering, maintenance; top down, bottom up, and other design approaches; varieties of structuring; criteria for software quality; planning, implementation, and coordination of software projects; on-going adaption and evolution of installed software. Major projects will employ a variety of languages including COBOL, FORTRAN, PL/I, and assembly.

3372. Logic Laboratory (3:0:9). Prerequisite: C S 2372. Integrated circuits are used to realize logic functions: decoders, half-adders, flip-flops, etc. Counting using sequential circuits. A ROM is used to execute sequential functions.

3375. Machine Structure and Organization (3:3:0). Prerequisite: C S 3350, 3372. Design alternatives for a computer system to satisfy market requirements. Analysis of present computer systems.

3381. Algorithmic Processes (3:3:0). Prerequisite: C S 1363. Algorithmic solutions of problems. Representational techniques and communications procedures with automatic languages. Study of iterative and recursive algorithms.

3382. Discrete Computational Structures (3:3:0). Prerequisite: C S 2351 and MATH 2360. Discrete structures, finite state machines, grammars, and languages. Computer representations of the above.

4303. Microprocessors for Business and Humanities (3:3:0). Introduces electrical concepts, number systems, word organization, RAMs, ROMs, control, and I/O concepts of microprocessors.

4311, 4312. Senior Projects I, II (3:0:9 each). Independent study projects in computer hardware and software to accompany fourth-year courses in computer science. Projects assigned to correlate the theory presented in the various senior electives.

4331. Special Topics in Computer Science (3). Prerequisite: Advanced standing and departmental approval. Individual studies in computer technology in special areas.

4352. Operating Systems (3:3:0). Prerequisite: C S 3352. Survey of computer resource allocation and management techniques; multiprogramming, multiprocessing, and paging systems. A typical operating system will be studied in detail.

4353. Compiler Construction (3:3:0). Prerequisite: C S 3361. Structure of compiler; approaches to parsing, symbol table management, and run-time storage optimization; introduction to code generation, error recovery, and code optimization.

4354. Data Base Organization (3:3:0). Prerequisite: C S 2351 and 3 hours of advanced computer science. Types, uses, and logical structure of data base systems; physical organization and handling of records and files; hashing and indexing techniques, searching and sorting algorithms.

4372. Analog and Digital Computation (3:3:0). Prerequisite: Senior standing. A treatment of analog and digital computer design and application.

4373. Microprocessors for Engineers and Scientists (3:3:0). Number systems, storage concepts, control units, I/O concepts, system operation, and several applications of microprocessors.

4376. Minicomputer Laboratory (3:0:9). Prerequisite: C S 3352. A number of projects on the modification and application of minicomputers. Students will write modified firmware packages and interface a minicomputer to various external systems.

4377. Control Structures of Computers (3:3:0). Prerequisite: C S 3352 or consent of instructor. Asynchronous, synchronous, and microprogrammed control structures of computer architecture; autonomous subcontrols; case studies in typical control features; instruction lookahead, multiprocessing, interrupt processing, and input-output.

4378. Microprocessor Applications Laboratory (3:0:9). Prerequisite: C S 4373. Application of microprocessors as data acquisition and control units. A program must be written, loaded into a PROM, interfaced, tested, and executed. Implementation of special functions.

4379. Microprogramming (3:3:0). Prerequisite: C S 3352, senior standing; corequisite: C S 4377. Investigation of architecture and applications of microprogrammable computers, writing of programs to execute predetermined functions, use of microprogramming to change computer architecture, real-time debugging.

4383. Finite State Machines (3:3:0). Prerequisite: Senior standing. An introduction to the design of digital logic using individual components and integrated circuits. Synchronous and asynchronous sequential machines, flip-flop, and multiplexers will be designed.

4391. Simulation (3:3:0). Construction of computerized models for simulation. Deterministic and probabilistic methods; simulation languages.

Engineering Physics

Coordinator: Professor Jimmy H. Smith (Interim Dean, Engineering).
Directors: Associate Professors Lynn L. Hatfield (Physics) and Erich E. Kunhardt (Electrical Engineering); Professors Portnoy (Electrical Engineering), Strickland (Mechanical Engineering), and Thomas (Physics); Associate Professors Jordan (Mechanical Engineering), Menzel (Physics), and Myles (Physics).

This area supervises the following degree program: ENGINEERING PHYSICS, *Bachelor of Science in Engineering Physics*. The program is a cooperative effort of the College of Engineering and the Department of Physics (College of Arts and Sciences). The program, which emphasizes flexibility and personalized advisement, is directed toward students who are seriously interested in the interplay of basic physics with work at the frontiers of engineering development. Each degree program must include a distinct engineering specialty which provides a cohesive set of engineering courses leading through upper level engineering design. Specialty areas in Electrical Engineering (electronics) and Mechanical Engineering (thermal science) are shown below; others are available in these and other engineering departments (Chemical Engineering, Civil Engineering, and Industrial Engineering).

No later than the first semester of the junior year, the student must select a specialty area within engineering and file a degree plan approved by the engineering advisor, physics advisor, and the Dean of the College of Engineering.

Engineering Physics Curriculum.

FIRST YEAR

Fall		*Spring*	
†MATH 1350, Anal. Geom.	3	†MATH 1351, Calculus I	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
PHYS 1305, Eng. Phys. Anal. I	3	ENGR 1306, Engr. Graphics	3
CHEM 1307, Prin. Chem. I	3	PHYS 1308, Prin. Phys. I	3
CHEM 1103, Prin. Chem. I (Lab.)	1	PHYS 1105, Prin. of Phys. I (Lab.)	1
POLS 2301, Amer. Govt., Org.	3	CHEM 1308, Prin. Chem. II	3
P.E., Band, or ROTC		CHEM 1104, Prin. Gen. Chem. II (Lab.)	1
		P.E., Band, or ROTC	
	16*		17*

SECOND YEAR

Fall		*Spring*	
†MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
POLS 2302, Amer. Pub. Pol.	3	M E 3341 or CH E 3330, Materials	3
PHYS 2301, Prin. Phys. II	3	PHYS 2402, Prin. Phys. III	4
PHYS 1106, Prin. of Phys. II (Lab.)	1	M E 3321, Engr. Thermo.	3
••E E 2303, Elect. Sys. Anal.	3	••E E 2304, Elect. Instr.	3
C E 2301, Statics	3		
	16		16

SUMMER SESSION

First Term		*Second Term*	
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3

THIRD YEAR

Fall		*Spring*	
MATH 3350, Math. for Engrs. I	3	MATH 3351, Math. for Engrs. II	3
PHYS 3104, Intermed. Lab.	1	PHYS 3306, Elect. & Mag.	3
PHYS 3305, Elect & Mag.	3	PHYS 3104, Intermed. Lab.	1
•••Engineering specialty elect.	5	‡Technical elective	3
Humanity elective	3	•••Engineering specialty elect.	6
	15		16

FOURTH YEAR

Fall		*Spring*	
PHYS 4121, Eng. Phys. Sem.	1	PHYS 4305, Mechanics	3
PHYS 4304, Mechanics	3	PHYS 4306, Senior Project	3
‡Technical elective	3	Humanity elective	3
•••Engineering specialty elect.	6	•••Engineering specialty elect.	6
Elective	3		
	16		15

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 133.
*Exclusive of P.E., Band, or ROTC.
†MATH 1551 and 1552 may be taken in lieu of MATH 1350, 1351, 1352.
‡Must be approved upper-level engineering or physics courses.
••E E 2301, 2302 may be substituted for E E 2303, 2304.
•••Must be selected from those listed below or others approved by coordinator, director, and dean. The first five courses in a given specialty area are required. At least 34 hours of engineering science and 17 hours of engineering design courses must be included in the degree plan.

Electrical Engineering (Electronics)

E E 3311, 3312, 3231, 3323, and 4317 plus 9 hours from E E 3361 or PHYS 4309, C S 4383, E E 4318, 4332, 4361, 4381.

Mechanical Engineering (Thermal Science)

M E 3318, 4312, 4314, 4315, and 4321 plus 9 hours from M E 4313, 4330, 4331, 4337, 4338, 4342.

Department of Engineering Technology

Professor Larry B. Masten, Chairperson.
Professors Helmers, MacKenzie, Mason, Newell, and Sanger; Associate Professors Graham, Jenkins, E. B. Reynolds, Teske, and Wagner; Assistant Professors Brandon, Plott, and H. L. Reynolds; Lecturers Gunn and Surendran; Visiting Assistant Professor Farley.

This department supervises the following degree program: ENGINEERING TECHNOLOGY, *Bachelor of Science in Engineering Technology*. Students may select work in three areas of specialization — construction, electrical-electronics, and mechanical technology.

Graduates in engineering technology play an important role in such areas as construction, manufacturing, field service, sales, quality control, and other general engineering support activities. The technologists, whose work emphasizes the application of established fundamentals and procedures to the solution of technical problems, serve as important members of industrial and engineering teams. Technological developments and operations involve many activities for which sophisticated mathematical skills and deep understanding of scientific theory are unnecessary and for which knowledge and understanding of technical methodology is most important. The program in engineering technology educates the student specifically for the technologist's role. Technology curricula are oriented toward specialized areas but are less rigorous mathematically and scientifically than engineering programs.

The curriculum in technology consists of a basic core of 64 semester hours of specified courses. These courses in basic science, humanities, social studies, mathematics, and applied science give a foundation in technology and general education. The remaining 66 hours of required course work vary with the student's choice of technology area and selection of electives. The program specializations allow in-depth training in the student's chosen field of occupational endeavor. Minor specialization in an additional technology field is afforded through technology electives. Students who have management aspirations may acquire a foundation in this area through judicious choice of business administration courses as electives.

The construction specialization stresses basic structural design and construction operations to prepare students to enter various phases of the construction industry. Course work includes transportation, contracts and specifications, safety, applied solar technology, cost estimating, scheduling, and structural design. The student's awareness of business activities is expanded through an elective program in other departments.

Through appropriate choice of program courses, students in electrical-electronics technology may stress either electronics or electrical power technology. Graduates are thus prepared to enter either the electronics or the electric power industries in such areas as applied design, installation, operations, maintenance, and sales.

The mechanical specialization offers courses both in mechanical design and in the design and operation of heat and mass transfer systems. The latter produce and control necessary environments for human comfort, manufacturing operations, and industrial processes utilizing mechanical equipment such as pumps, fans, blowers, combustion engines, compressors, steam equipment, and heat

exchangers. The field of mechanical design relates to any assembly or component of any device that has motion. This field is particularly challenging to a creative and innovative student since design constraints often reduce to physical properties of materials and to economic considerations.

Students are required to plan their program in consultation with faculty advisors.

The Department of Engineering Technology will permit students to receive credit for any courses in the curriculum if they can demonstrate proficiency in that area by examination. It is the responsibility of the students to petition the department chairperson for such examination(s) well before they would enroll in the course(s).

The examination for credit for E GR 1306, Engineering Graphics, is held only in the fall, the first Friday after classes begin. Students must register for the examination in Room 211, Engineering Center, by 5 p.m. the first Wednesday after classes begin for the fall term. Students should have a background in beginning drawing and descriptive geometry.

To be admitted to junior standing as an engineering technology major, a student must submit a petition to the department prior to registration for junior engineering technology courses; its acceptance depends upon the student's grade record and completion of prerequisite courses.

Engineering Technology Curriculum.

FIRST YEAR

Fall		*Spring*	
MATH 1320, Coll. Algebra	3	GET 1311, Engr. Tech. I	3
E GR 1306, Engr. Graphics	3	HIST 2300, Hist. of U.S. to 1877	3
CHEM 1305, Ess. Chem. I	3	CHEM 1306, Ess. Chem. II	3
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1321, Trigonometry	3	CET 1312, EET 1312, or MET 1312	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	16*		16*

Construction Specialization

SECOND YEAR

Fall		*Spring*	
MATH 2322, Calc. Engr. Tech.	3	MATH 2323, Calc. Engr. Tech.	3
PHYS 1306, Gen. Phys.	3	PHYS 1307, Gen. Phys.	3
PHYS 1103, Exp. Gen. Phys. (Lab.)	1	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
HIST 2301, Hist. of U.S. since 1877	3	**General elective	3
GET 2311, Appl. Mech. I	3	CET 2301, Surveying and Surveys	3
Elective (humanity)	3	GET 2321, Elec. Circ. & Mach.	3
	16		16

THIRD YEAR

Fall		*Spring*	
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
CET 3311, Struct. Graphics I	3	GET 2351, Intro. to Thermo.	3
CET 3302, Transportation Tech.	3	CET 3312, Struct. Graphics II	3
†Elective (technology)	6	CET 3313, Found. & Earthwork	3
**General elective	1	†Elective (technology)	3
		CET 3301, Constr. Materials	3
	16		18

FOURTH YEAR

Fall		*Spring*	
CET 4312, Struc. Design II	3	CET 4311, Struct. Design I	3
†Elective (technology)	3	†Elective (technology)	3
Elective (humanity)	3	Elective (humanity)	3
••General elective	7	••General elective	7
	16		16

†15 hours of technical electives must include GET 3311 and 3312 or their equivalent.

Electrical Electronics Specialization

SECOND YEAR

Fall		*Spring*	
MATH 2322, Calc. Engr. Tech.	3	MATH 2323, Calc. Engr. Tech.	3
PHYS 1306, Gen. Phys.	3	PHYS 1307, Gen. Phys.	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
EET 2311, Elect. Technology I	3	†Elective (technology)	3
EET 2331, Elect. Measurements	3	EET 2312, Elect. Technology II	3
GET 2321, Elec. Circuits & Mach.	3	EET 2332, Electronics Lab.	3
	16		16

THIRD YEAR

Fall		*Spring*	
GET 2311, Applied Mech. I	3	GET 2351, Intro. to Thermo.	3
†Elective (technology)	3	†Elective (technology)	3
EET 3331, Electronics Lab. II	3	EET 3332, Electronic Systems Lab.	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
••General elective	3	••General elective	3
HIST 2301, Hist. of U.S. since 1877	3	Elective (humanity)	3
	18		18

FOURTH YEAR

Fall		*Spring*	
EET 4331, Electronic & Sys. Lab. II	3	EET 4332, Spec. Electronics Proj.	3
†Elective (technology)	3	†Elective (technology)	3
Elective (humanity)	3	Elective (humanity)	3
••General elective	6	••General elective	6
	15		15

†Appropriate engineering technology or engineering courses, approved by the department chairperson, may be used to satisfy the technology elective requirements.

Mechanical Specialization

SECOND YEAR

Fall		*Spring*	
MATH 2322, Calc. Engr. Tech.	3	MATH 2323, Calc. Engr. Tech.	3
PHYS 1306, Gen. Phys.	3	PHYS 1307, Gen. Phys.	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
HIST 2301, Hist. of U.S. since 1877	3	GET 2351, Intro. to Thermo.	3
MET 3321, Graphics	3	GET 2311, Appl. Mech. I	3
Elective (humanity)	3	••General elective	3
	16		16

THIRD YEAR

Fall		*Spring*	
GET 2321, Elect. Cir. & Mach.	3	MET 3312, Anal. Vap. & Gas Cycles & Equip.	3
MET 4341, Metals Tech.	3	MET 3322, Mech. Tech. Lab. I	3
MET 4351, Mech. of Machinery	3	POLS 2302, Amer. Pub. Pol.	3
POLS 2301, Amer. Govt., Org.	3	†Elective (technology)	6
GET 3311, Strength of Matls.	3	**General elective	3
**General elective	3		
	18		18

FOURTH YEAR

Fall		*Spring*	
MET 4321, Mech. Tech. Lab. II	3	MET 4322, Mech. Tech. Lab. III	3
†Elective (technology)	6	Elective (humanity)	3
**General elective	3	†Elective (technology)	3
Elective (humanity)	3	**General elective	6
	15		15

†Appropriate engineering technology or engineering courses, approved by the department chairperson, may be used to satisfy the technology elective requirements.
*Exclusive of P.E., Band, or ROTC.
**The 18 hours of general electives enables students to select courses in areas such as business administration, management, and other fields of their particular interest. Selected technology courses will also fulfill this requirement. The general electives must be approved by a counselor and must include 12 hours of upper-division courses.

Courses in Engineering Graphics. (E GR)

1306. Engineering Graphics (3:0:6). Introduction to space relationships; principles of size and shape pertinent to engineering, free-hand sketching, orthographics, pictorials, graphical presentation of data, engineering geometry, and experimental presentation of data.

Courses in General Engineering Technology. (GET)

1311. Engineering Technology I (3:3:0). Theory and practice in engineering measurement and operations. Logical solutions of numerical problems. Introduction to computers and computer programming.

2311. Applied Mechanics I — Statics (3:3:0). Prerequisite: PHYS 1306, 1103; corequisite: MATH 2322. Equilibrium of planer structures; beams, trusses, frames. Friction, moments of inertia, structural mechanics.

2321. Electrical Circuits and Machines (3:3:0). Prerequisite: PHYS 1306, 1103; MATH 2322. Principles of electric and magnetic circuits and their application in the operation of electric power equipment.

2351. Introduction to Thermodynamics (3:3:0). Prerequisite: PHYS 1306, 1103; corequisite: MATH 2323. A study of the fundamental laws of thermodynamics and their application to analysis of gas, steam, and refrigeration cycles.

3311. Applied Mechanics II — Strength of Material (3:3:0). Prerequisite: GET 2311. A study of the elastic and plastic behavior of materials and structural elements.

3312. Applied Mechanics III — Fluids (3:3:0). Prerequisite: GET 2311. Fluid statics and dynamics, flow of fluids in pipe and open channels, and fluid measurements.

4121. Engineering Technology Seminar (1). Prerequisite: Advanced standing and approval of department chairperson. Individual study of engineering technology problems of special interest and value to the student. May be repeated for credit.

4331. Special Topics in Engineering Technology (3). Prerequisite: Advanced standing and approval of chairperson. Individual studies in special areas in engineering technology. May be repeated for credit.

4332. Special Experimental Studies in Engineering Technology (3). Prerequisite: Advanced standing and approval of chairperson. Individual experimental work on topics of special interest to students. May be repeated for credit.

Courses in Construction Engineering Technology. (CET)

1312. Construction Methods (3:3:0). Study of construction activities, job planning, engineering fundamentals, and equipment. Field trips to local construction projects and a technical report are required.

2301. Surveying and Surveys (3:2:3). Prerequisite: MATH 1350 or 2322. Care and use of modern surveying equipment; differential leveling, area calculations; horizontal and vertical curves; effects of observation errors.

3301. Construction Materials (3:0:9). Prerequisite: GET 3311 and CET 2301. Construction engineering technology measurements laboratory, including construction materials, soil properties, and land surveying measurements.

3302. Transportation Technology (3:3:0). Prerequisite: CET 2301, GET 2311. Design of components of the transportation system needed for modern society with practical examples.

3311. Structural Graphics I (3:3:0). Corequisite: GET 3311. Graphical and numerical solutions in structural analysis.

3312. Structural Graphics II (3:3:0). Prerequisite: CET 3311. Graphical and numerical solutions in structural analysis.

3313. Foundations and Earthwork (3:3:0). Prerequisite: GET 3311. Soil properties and the design of foundations for structures.

4311. Structural Design I (3:3:0). Prerequisite: CET 3312. Design of reinforced concrete elements with detail drawings.

4312. Structural Design II (3:3:0). Prerequisite: CET 3312. Design of structural metal elements with detail drawings.

4331. Special Topics in Construction Technology (3). Prerequisite: Senior standing. Special study project within field of interest of student.

4341. Construction Management (3:3:0). Prerequisite: Senior standing or consent of instructor. Modern methods for managing construction projects including critical path scheduling, resource allocation, and funds flow. Practical applications are made through simulated projects.

4342. Cost Estimating. (3:3:0). Prerequisite: Senior standing or consent of instructor. Computation of material quantities; estimating unit costs, indirect costs, labor costs, and overhead; preparation of bid for projects.

4343. Construction — Safety and Health (3:3:0). Prerequisite: Senior standing or consent of instructor. Principles of construction — safety, OSHA, health and first aid, field practice, student reports.

4344. Active Solar Technology (3:3:0). Prerequisite: PHYS 1306, 1103, 1307, 1104, and junior standing. Review of principles of radiation, collection, and storage; practical applications of residential active systems; computer assisted f-chart design with emphasis on life cycle cost analysis.

4345. Passive Solar Technology (3:3:0). Prerequisite: CET 4344 or consent of instructor. Principles and concepts of detailed design methods for direct gain and Trombe wall (and combinations) systems; guidelines for sizing collectors, storage, and orientation; economic analysis.

Courses in Electrical-Electronics Engineering Technology. (EET)

1312. Principles of Electrical Engineering Technology (3:3:0). Prerequisite: MATH 1320; concurrent enrollment in MATH 1321, consent of instructor. Fundamentals of direct and alternating current circuits.

2311. Electrical Technology I (3:3:0). Prerequisite: EET 1312 and concurrent enrollment in MATH 2322, or approval of department chairperson. Fundamentals of circuit theory applied to active devices.

2312. Electrical Technology II (3:3:0). Prerequisite: EET 2311 and concurrent enrollment in MATH 2323, or approval of department chairperson. Characteristics of active devices and electronic circuits.

2314. Computer Technology (3:3:0). Prerequisite: Consent of instructor. An introduction to basic digital hardware, logic circuits, and computers.

2321. Electronics Measurements (3:0:9). Prerequisite: EET 2331. A laboratory to familiarize students with advanced electronic measurement apparatus. Transient and high frequency measurements of electronic devices.

2331. Electrical Measurements (3:0:9). Prerequisite: Concurrent enrollment in EET 2311. A laboratory course to accompany EET 2311. To provide experience in the use of measurement apparatus on simple devices. Techniques of electronic construction.

2332. Electronics Laboratory (3:0:9). Prerequisite: EET 2314, 2331, concurrent enrollment in EET 2312. A laboratory course to provide experience in the design and testing of electronic devices and circuits. Operation of devices, applications of various network theorem to electronic circuits.

3311. Electronics Technology I (3:3:0). Prerequisite: EET 2312. Applications of electronic devices in amplifiers, oscillators and communication circuits.

3312. Electronics Technology II (3:3:0). Prerequisite: EET 2312. A study of advanced and specialized communication systems and opto-electronics.

3321. Circuits and Systems (3:3:0). Prerequisite: EET 2312, MATH 2323. Advanced circuit theory with an introduction to system concepts and design.

3324. Applications of Linear Integrated Circuits (3:3:0). Corequisite: EET 3331. Applications of op amps, phase locked loops, and other linear integrated circuits.

3331. Electronics Laboratory II (3:0:9). Prerequisite: EET 2332, concurrent enrollment in EET 4314. A laboratory course to accompany first-semester junior courses in electrical-electronics engineering technology.

3332. Electronics Systems Lab I (3:0:9). Prerequisite: EET 3331, concurrent enrollment in EET 3324. A laboratory course to accompany second-semester junior courses in electrical-electronics engineering technology.

4312. High Frequency Techniques (3:3:0). Prerequisite: Senior standing and consent of instructor. An introduction to high frequency systems, including transmission lines, antennas, and microwave systems.

4314. Applications of Integrated Circuits in Digital Systems (3:3:0). Prerequisite: EET 2314. An introduction to MSI and LSI Digital IC's with emphasis on applications.

4316. Minicomputer Technology (3:3:0). Prerequisite: EET 4314. Fundamentals of minicomputer operations, programming, and applications.

4317. Advanced Electronic Systems (3:3:0). Prerequisite: EET 3332. The study of advanced electronic circuits and their incorporation into functional systems.

4331. Electronic and Systems Lab II (3:0:9). Prerequisite: EET 3332; corequisite: 3321. A laboratory course to accompany first-semester senior courses in electrical-electronics engineering technology.

4332. Special Electronics Projects (3:0:9). Prerequisite: EET 4331; corequisite: 4353. A laboratory to design and fabricate complete electronic systems. Accompanies second-semester senior courses in electrical-electronics engineering technology.

4351. Electrical Power Applications (3:3:0). Prerequisite: Consent of instructor. Fundamentals of power apparatus and systems.

4353. Electro-mechanical Control Systems (3:3:0). Prerequisite: EET 3332, 3321. An introduction to automatic control systems and the electro-mechanical components used in control systems.

Courses in Mechanical Engineering Technology. (MET)

1312. Mechanical Engineering Technology (3:3:0). Introduction to manufacturing processes and plant operations; construction methods and practices; plant visits and field trips; familiarization with equipment and instruments; metal fabrication, machine tools, welding, heat treating, and associated safety practices.

3312. Analysis of Vapor and Gas Cycles and Equipment (3:3:0). Prerequisite: GET 2351. Evaluation of power and refrigeration cycles. The application of cycles and component equipment to refrigeration and power systems. Single energy source systems.

3319. Environmental Control I (3:3:0). Prerequisite: ARCH 2432 and PHYS 1307, 1104. Basic principles and their application to the design of environmental, lighting, acoustic, water supply, and electrical systems of buildings. Solutions of related problems. Only for students of architecture.

3320. Environmental Control II (3:3:0). Prerequisite: MET 3319. Basic principles and their application to the design of environmental, lighting, acoustic, water supply, and electrical systems of buildings.

3321. Graphics for the Mechanical Engineering Technologist (3:0:6). Prerequisite: E GR 1306. Technical and machine drafting, including the design and detailing of pipe systems and duct systems.

3322. Mechanical Technology Laboratory I (3:2:3). Corequisite: MET 3312. Mechanical instrumentation and performance testing of heat power and refrigeration equipment.

4311. Air Conditioning System Design (3:3:0). Prerequisite: MET 3312. The design and arrangement of air-conditioning systems. Performance and selection of coils, fans, pumps, and filter systems. Automatic control systems.

4312. Applied Energy Conversion (3:3:0). Prerequisite: GET 2351. The thermodynamics and dynamics of utility power stations. Steam turbines, gas turbines, internal combustion engines. Conventional and nuclear fuels. An analysis of the criteria for plant type and auxiliary selection. Water conditioning and plant economics.

4321. Mechanical Technology Laboratory II (3:2:3). Prerequisite: MET 3322. In-depth study and analysis of internal combustion engines and automotive engineering, including suspension systems and handling characteristics. Instrumentation and performance testing under various conditions of speed and loadings. System evaluation.

4322. Mechanical Technology Laboratory III (3:2:3). Prerequisite: MET 3322. Mechanical project laboratory. Design and/or analysis of a project of a student's choice approved by the faculty advisor.

4332. Specialized Topics in Mechanical Engineering Technology (3). Prerequisite: Senior standing and consent of instructor. In-depth study of specialized topics of particular interest to the mechanical engineering technologist. May be repeated for credit.

4341. Metals Technology (3:3:0). Prerequisite: Junior or senior standing. Introduction to physical metallurgy. Fundamental nature of the structure and properties of

metals, mechanical properties, and behavior of metals based upon their metallurgical constitution.

4351. Mechanisms of Machinery (3:3:0). Prerequisite: MATH 2322. Kinetic analysis and synthesis of cams, gears, and linkages. Applications to machine elements and assemblies.

4352. Dynamics of Machinery (3:3:0). Prerequisite: MET 4351. Study of dynamic forces generated in machinery. Balancing of rotating and reciprocating machines. Calculation of natural frequencies of vibration of mechanical systems.

4353. Mechanical Design (3:3:0). Prerequisite: GET 3311, MET 4341, MET 4351. Analysis of stresses and deformations in machine elements. Product analysis, design, development, and evaluation.

Department of Industrial Engineering

Horn Professor Richard Albert Dudek, Chairperson.
Horn Professor Ayoub; Professors Burford, MacKenzie, Ramsey, and M. Smith; Associate Professors Jenkins, Lambert, and Marcy; Assistant Professors J. L. Smith and Yum; Lecturers Denardo and Maddox.

This department supervises the following degree programs: INDUSTRIAL ENGINEERING, *Bachelor of Science in Industrial Engineering, Master of Science in Industrial Engineering, Doctor of Philosophy.* The undergraduate degree requirements appear in the accompanying curriculum table. The curriculum is designed to equip the student for professional pursuits in the analysis and design of man-machine work systems in keeping with the goals of the College of Engineering. In addition to the college requirements for graduation, industrial engineering students must have at least a 2.00 grade-point average in industrial engineering, engineering science, mathematics, and science work. A grade of D in any degree plan courses will be accepted only at the discretion of the department.

Industrial Engineering Curriculum.

FIRST YEAR

Fall		*Spring*	
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
I E 1305, Engr. Anal. I	3	E GR 1306, Engr. Graphics	3
CHEM 1307, Prin. of Chem. I	3	Elective (basic science)	4
CHEM 1103, Prin. Chem. I (Lab.)	1	POLS 2301, Amer. Govt., Org.	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	13*		16*

SECOND YEAR

Fall		*Spring*	
MATH 1352, Calculus II	3	M E 3321, Engr. Thermo.	3
PHYS 1308, Prin. of Phys. I	3	MATH 2350, Calculus III	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	C E 3302, Dynamics or C E 3303	3
C E 2301, Statics	3	I E 3340, Engr. Stat.	3
I E 3320, Intro. Sys. Anal.	3	PHYS 2301, Prin. of Phys. II	3
CH E 3330, Engr. Matl. Sci. or M E 3341, Matls. I	3	PHYS 1106, Prin. of Phys. II (Lab.)	1
	16		16

THIRD YEAR

Fall		*Spring*	
I E 3344, Q.C. & Engr. Stat.	3	I E 3342, Op. Research I	3
I E 3360, Work Anal. & Des.	3	I E 3324, Work Syst. Contr.	3
ECO 2305, Prin. of Eco.	3	ACCT 2304, Ind. Acct. Engrs.	3
MATH 3350, Math. for Engrs. I	3	Elective (general)	3
E E 2303, Elec. Sys. Anal.	3	POLS 2302, Amer. Pub. Pol.	3
	15		15

SUMMER

First Term		*Second Term*	
I E 3364, Manufc. Proc. I	3	I E 3322, Engr. Eco. Anal.	3
Elective (humanities)	3	Elective (humanities)	3
	6		6

FOURTH YEAR

Fall		*Spring*	
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
I E 4365, Facil. Plan. & Des.	3	I E 4366, Manag. Syst. Des.	3
†Elective (I.E. technical)	6	†Elective (I.E. technical)	6
Elective (technical)	3		
	15		12

Minimum hours required for graduation exclusive of P.E., Band, or ROTC — 130.
*Exclusive of P.E., Band, or ROTC.
†I.E. technical electives from the following courses: I E 3362, 4320, 4331, 4342, 4344, 4360, 4364.

Courses in Industrial Engineering. (I E)

1305. Engineering Analysis I (3:3:0). The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. FORTRAN programming. Synthesis and analysis of typical engineering problems.

3101. Computer Programming Techniques Laboratory (1). Prerequisite: I E 3201 or concurrent enrollment. Computer programming techniques and methods applied to programming exercises.

3201. Computer Programming Techniques (2:2:0). Programming techniques for computers, emphasis on FORTRAN. Degree credit will be given for only one basic FORTRAN course.

3300. Systems, Complexity, and Society (3:3:0). Prerequisite: Consent of instructor and sophomore standing. Human problem solving in the technological age. The impacts of modern technologies on man-machine relationships, organizations, and institutions.

3302. Systems Organization and Management (3:3:0). Prerequisite: Consent of instructor and sophomore standing. Modern systems management. System structure, process selection, and information. Design of manufacturing systems and organizational processes; use of work measurement in system management.

3303. Introduction to Systems Science Methods (3:3:0). Prerequisite: Consent of instructor, sophomore standing, and MATH 1321. An appreciation of modeling methods in logical and quantitative terms. Development of systems science. Statistical concepts in system modeling. Systems analysis using linear programming models. Introduction to computer methods for planning and systems analysis.

3307. Systems Planning and Control (3:3:0). Prerequisite: Consent of instructor and sophomore standing. Control functions, types of production and control, forecasting and estimating, initiating production control, flow control, block and load control. Communication and information systems.

3308. Elements of Methods Analysis (3:2:3). Prerequisite: Consent of instructor and sophomore standing. Science and work, the work system, work simplification,

operations analysis, forms control and design. Method improvements and principles of effective work. Survey of work measurement, work sampling.

3309. Work Environment and Man (3:3:0). Prerequisite: Consent of instructor and sophomore standing. History of ergonomics and work practices of early man. Impacts of new technologies and the ability to alter the work environment. Implications of new legislation concerning safety, health, and the environment.

3320. Introduction to Systems Analysis (3:3:0). The systems analysis approach to industrial organization and management. Management objectives, resource planning, production operations, decision theory, model formulation, and organizational coordination and control.

3322. Engineering Economic Analysis (3:3:0). Prerequisite: Junior classification. Evaluation of engineering proposals and operations using time value of money. Selections between alternatives, depreciation, income taxes, replacement studies, life cycle costing.

3324. Work Systems Control (3:3:0). Production control systems, production planning, forecasting, scheduling, materials and inventory control systems and models, learning curves, critical path methods of PERT and CPM.

3340. Engineering Statistics (3:3:0). Corequisite: MATH 2350. Descriptive statistics, probability theory, discrete and continuous distributions, sampling distributions, one and two parameter hypothesis testing.

3342. Operations Research I (3:3:0). Introduction to operations research. Emphasis on linear programming. Other topics include transportation and assignment problems.

3344. Quality Control and Engineering Statistics (3:3:0). Prerequisite: I E 3340 or equivalent. Statistical quality control including control charts, acceptance sampling, rectifying inspection and quality control relationships to total cost. Regression and correlation analysis.

3360. Work Analysis and Design (3:2:3). Corequisite: I E 3340. Principles and techniques of work measurement, methods engineering, work sampling, and predetermined time systems. Basic biotechnology including ergonomic principles and design; physiological work measurement.

3362. Safety Engineering (3:3:0). Prerequisite: Junior standing. Principles of industrial safety engineering. Accident costs, prevention methods, investigations and reports. OSHA, systems safety, environmental control.

3364. Manufacturing Processes I (3:2:3). Prerequisite: CH E 3330 or M E 3341. Fundamentals of materials and processes for manufacturing including casting, welding, forming, and machining processes; fundamentals of metrology for manufacturing; economics of processing.

4180. Industrial Engineering Seminar (1). Prerequisite: Advanced standing and departmental approval. Individual study of engineering problems of value to the student. May be repeated.

4305. Technology Assessment (3:2:3). Prerequisite: Consent of instructor and junior standing. Policy analysis to evaluate the societal consequences of man's emerging technologies. Current methods of technology assessment and new methodologies. A survey of completed and ongoing technology assessment. Students participate in a mini-ta laboratory.

4320. Management Systems Control (3:3:0). Prerequisite: Senior standing. Cost control techniques for management, methods of financial statement analysis, capital and expense budgets, cost ratios, cost behavior, pricing methods, and overhead allocation methods.

4331. Individual Studies in Industrial Engineering (3). Prerequisite: Advanced standing and departmental approval. May be repeated.

4342. Reliability and Engineering Statistics (3:3:0). Prerequisite: I E 3344 or equivalent. Reliability: failure time distribution models, estimation, hazard functions, reliability of systems. Nonparametric statistics, forecasting, time series, statistical computer routines.

4344. Operations Research II (3:3:0). Prerequisite: I E 3340 or equivalent, I E 3342, or consent of instructor. Queueing theory, inventory models. Mathematical programming, simulation.

4360. Man-Machine Systems (3:2:3). Prerequisite: Consent of instructor. Human performance in man-machine systems. Includes human sensory, motor, and information processes; man-machine dynamics; and environmental effects on human performance.

4364. Manufacturing Processes II (3:3:0). Prerequisite: I E 3364 or consent of instructor. Analysis of new processes such as electro-chemical machining, electric discharge machining, ultrasonic machining, and an introduction to numerical control.

4365. Facilities Planning and Design (3:3:0). Prerequisite: Consent of instructor. Modern plant layout and materials handling practices, stressing the importance of interrelationships with management planning, product and process engineering, methods engineering and production control.

4366. Management Systems Analysis and Design (3:3:0). Prerequisite: Industrial engineering senior. Solving of case studies relating to production, management, and organization in several industries. Emphasis is on utilizing industrial engineering techniques covered in all previous course work.

Department of Mechanical Engineering

Professor James H. Lawrence, Chairperson.
Professors Davenport, Powers, and Strickland; Associate Professors Carper, Dunn, W. Jones, Jordan, Martin, and Reis; Assistant Professors Ibrahim, McLauchlan, Oler, and Pederson; Lecturers Blackstone and J. Jones; Visiting Assistant Professor Eftekhar; Part-time Lecturer Vaughn.

This department supervises the following degree programs: MECHANICAL ENGINEERING, *Bachelor of Science in Mechanical Engineering, Master of Science in Mechanical Engineering, Doctor of Philosophy.*

Before enrolling in major courses shown in the curriculum table for the junior or senior years, a student must have earned a grade of C or better in MATH 1350, 1351, 1352, 2350, C E 2301, and M E 3314. A student who receives a D or F in any of these courses must immediately repeat that course.

The department expects its students to have computational devices for use in the classroom and at home. At the present time, the department recommends that students have a scientific calculator with at least ten data storage registers and some programmable capability for classroom use. The student may also find it advantageous to have a personal computer for home use with floating-point BASIC, a minimum of 16K RAM, and some type of external data storage.

The undergraduate degree requirements appear in the accompanying curriculum table.

Mechanical Engineering Curriculum.

FIRST YEAR

Fall		*Spring*	
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	3
M E 1305, Engr. Anal. I	3	E GR 1306, Engr. Graphics	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. Chem. I (Lab.)	1	CHEM 1104, Prin. Chem. II (Lab.)	1
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
P.E., Band, ROTC		P.E., Band, ROTC	
	16*		16*

SECOND YEAR

Fall		*Spring*	
MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
M E 3314, Mechanisms	3	C E 3303, Mech. of Solids	3
PHYS 1308, Prin. of Phys. I	3	PHYS 2301, Prin. of Phys. II	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	PHYS 1106, Prin. of Phys. II (Lab.)	1
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
C E 2301, Statics	3	M E 3341, Materials I	3
	16		16

THIRD YEAR

Fall		*Spring*	
MATH 3350, Higher Math. Engr.	3	M E 3316, Meth. Anal. Mech. Engr.	3
M E 3321, Engr. Thermo. I	3	M E 3342, Materials II	3
M E 3318, Mech. Engr. Lab. I	3	E E 2304, Electronic Inst.	3
E E 2303, Elec. Sys. Anal.	3	M E 3331, Dynamics	3
†Elective (humanity)	3	†Elective (humanity)	3
	15		15

SUMMER SESSION

First Term		*Second Term*	
M E 4312, Mech. Engr. Lab. II	3	M E 4313, Mech. Engr. Lab. III	3
M E 4314, Fluid Mech.	3	M E 4315, Heat Trans.	3
	6		6

FOURTH YEAR

Fall		*Spring*	
M E 4316, Mech. Vibrations	3	M E 4321, Engr. Thermo. II	3
M E 4333, Dynamics of Sys.	3	M E 4334, Control of Sys.	3
M E 4335, Design I	3	M E 4336, Design II	3
†Elective	3	†Elective (technical)	3
‡Elective (technical)	3		12
	15		

Minimum hours for graduation, exclusive of P.E., Band, or ROTC — 133.
*Exclusive of P.E., Band, or ROTC.
†Requires departmental approval.
‡Not in mechanical engineering (requires departmental approval).

Courses in Mechanical Engineering. (M E)

1305. Engineering Analysis I (3:3:0). Corequisite: MATH 1350. Introductory problems characteristic of mechanical engineering. Instruction in FORTRAN and calculator programming.

3314. Mechanisms (3:3:0). Prerequisite: MATH 1351 or equivalent. Kinematic analysis and synthesis of cams, gears, linkages.

3316. Methods of Analysis in Mechanical Engineering (3:3:0). Prerequisite: MATH 3350. A unified introductory treatment of mathematical models for mechanical systems; analytical and numerical solutions.

3318. Mechanical Engineering Laboratory I (3:2:3). Corequisite: M E 3321. General experimental methods, uncertainty analysis, report writing, and basic instrumentation principles as applied to mechanical engineering systems.

3321. Engineering Thermodynamics I (3:3:0). Corequisite: MATH 3350. Fundamental concepts, thermodynamic systems, properties of pure substances, first and second laws and applications.

3331. Dynamics (3:3:0). Prerequisite: MATH 3350, C E 3303. Introductory principles and applications of nonsteady forced motion of particles and rigid bodies.

3341. Materials I (3:3:0). Prerequisite: CHEM 1307, 1101. Fundamental thermodynamic and chemical nature of the structure and properties of materials.

3342. Materials II (3:2:3). Prerequisite: M E 3341. Mechanical properties and behavior of engineering materials based on their metallurgical constitution.

4121. Mechanical Engineering Seminar (1). Prerequisite: Advanced standing and approval of departmental adviser. Studies of an advanced topic in mechanical engineering. May be repeated for credit.

4131. Individual Study in Mechanical Engineering (1). Prerequisite: Advanced undergraduate standing. Individual study in an advanced mechanical engineering area. May be repeated for credit.

4312. Mechanical Engineering Laboratory II (3:2:3). Prerequisite: M E 3318 and senior standing. Experimental investigations of problems characteristic of mechanical engineering.

4313. Mechanical Engineering Laboratory III (3:2:3). Prerequisite: M E 4312. Experimental investigations of problems characteristic of mechanical engineering.

4314. Fluid Mechanics (3:3:0). Prerequisite: M E 3321 and 3316 or equivalent. Basic principles of fluid mechanics, fluid statics, ideal and viscous fluid flows, and compressible flow.

4315. Heat Transfer (3:3:0). Prerequisite: M E 3321 and 3316 or equivalent. Introduction to heat transfer by the mechanisms of conduction, convection, and radiation.

4316. Mechanical Vibrations (3:3:0). Prerequisite: M E 3331. Free and forced vibration of damped and undamped single and multi-degree of freedom mechanical systems.

4321. Engineering Thermodynamics II (3:3:0). Prerequisite: M E 3321 and senior standing. Principles of thermodynamics for general systems, thermodynamics of state, thermodynamics of nonreacting and reacting mixtures, availability.

4330. Special Topics in Mechanical Engineering (3:3:0). Prerequisite: Advanced undergraduate standing. Studies of advanced topics in mechanical engineering. May be repeated for credit.

4331. Individual Study in Mechanical Engineering (3). Prerequisite: Advanced undergraduate standing. Individual study in advanced mechanical engineering areas. May be repeated for credit.

4332. Special Experimental Problems in Mechanical Engineering (3). Prerequisite: Advanced undergraduate standing. Individual experimental study in advanced mechanical engineering areas. May be repeated for credit.

4333. Dynamics of Systems (3:3:0). Prerequisite: M E 3316. Analysis of dynamic mechanical, electric, fluid and/or thermal system elements; modeling of physical, dynamic systems.

4334. Control of Systems (3:3:0). Prerequisite: M E 4333. Analysis of controlled, dynamic, linear mechanical, electric, fluid and/or thermal systems; introduction to concepts of stability and nonlinear control theory.

4335. Design I (3:3:0). Prerequisite: M E 3314, C E 3303, and senior standing. Analysis of stresses and deformations in and functions of machine elements.

4336. Design II (3:3:0). Prerequisite: M E 4335. Product analysis, design, development, and evaluation.

4337. Nuclear Engineering (3:3:0). Prerequisite: Junior or senior standing in the engineering curriculum or permission of instructor. The mathematical model of the atom; principles of fission and fusion; principles of homogeneous and heterogeneous reactors; radiation safety.

4338. Solar Systems Design (3:3:0). Prerequisite: M E 4315. Fundamental principles of the design and analysis of solar systems and components with emphasis on computer simulation of solar heating and cooling.

4342. Corrosion (3:3:0). Prerequisite: M E 3341, 3342, and senior standing. The electrochemical, environmental, and metallurgical aspects of corrosion. The forms of corrosion and the methods of corrosion prevention are discussed.

Department of Petroleum Engineering

Professor Robert E. Carlile, Chairperson.
Professors Land, Smith, and Winkler; Associate Professor Crawford; Assistant Professor Kowalski. Lecturers Maciula and Olson.

This department supervises the following degree program: PETROLEUM ENGINEERING, *Bachelor of Science in Petroleum Engineering.* The objective of the department is to provide the professional training necessary to prepare an individual for a successful career in the petroleum industry.

Petroleum engineering is the practical application of the basic sciences of geology, physics, and chemistry and all of the engineering sciences to the discovery, development, production, and transportation of petroleum. Petroleum is the most widely used form of mobile energy and now supplies approximately three-fourths of the total energy used in the United States. It is also a major raw material from which a wide variety of products are manufactured. Petroleum contributes richly to the welfare of this nation, and petroleum engineers play a vital role in helping provide this essential resource.

Students applying for transfer into this program from another institution or from another college at Texas Tech must have at least 30 semester hours with a minimum 2.60 cumulative grade-point average. Transfer applicants must also have minimum grade-point averages of 2.60 for all credits attempted in mathematics, science, and engineering courses.

Petroleum Engineering Curriculum.

FIRST YEAR*

Fall		*Spring*	
MATH 1350, Anal. Geom.	3	MATH 1351, Calc. I	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
PETR 1305, Engr. Anal. I	3	E GR 1306, Engr. Graphics	3
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. Chem. I (Lab.)	1	CHEM 1104, Prin. Chem. II (Lab.)	1
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
P.E., Band, or ROTC		P.E., Band, or ROTC	
	16†		16†

SECOND YEAR

Fall		*Spring*	
MATH 1352, Calc. II	3	PHYS 2301, Prin. of Phys. II	3
PHYS 1308, Prin. of Phys. I	3	PHYS 1106, Prin. of Phys. II (Lab.)	1
PHYS 1105, Prin. of Phys. I (Lab.)	1	MATH 2350, Calc. III	3
POLS 2301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
PETR 3301, Petr. Develop.	3	C E 3305, Mech. of Fluids	3
C E 2301, Statics	3	C E 3303, Mech. of Solids	3
	16		16

SUMMER SESSION

First Term

GEOL 1303, Phys. Geology	3
GEOL 1101, Phys. Geology Lab.	1
MATH 3350, Math. Engrs. I	3
	7

THIRD YEAR

Fall		*Spring*	
PETR 3201, Phase Behavior	2	PETR 3303, Petr. Prod. Meth.	3
PETR 3202, Rot. Drlg. Fluids	2	PETR 3304, Well Logging Meth.	3
E E 2303, Elect. Sys. Anal.	3	PETR 3103, Production Lab.	1
CHEM 3307, Phys. Chem.	3	E E 2304, Electronic Instr.	3
CHEM 3107, Phys. Chem. Lab.	1	PETR 3302, Res. Rock Prop.	3
M E 3321, Engr. Thermo.	3	GEOL 1304, Hist. Geology	3
C E 3302, Dynamics	3	GEOL 1102, Hist. Geology Lab.	1
	17		17

FOURTH YEAR

Fall		*Spring*	
PETR 4331, Special Problems	3	PETR 4121, Petr. Engr. Sem.	1
PETR 4303, Reservoir Engr.	3	PETR 4305, Adv. Nat. Gas. Engr.	3
PETR 4106, Reservoir Engr. Lab.	1	PETR 4105, Nat. Gas Lab.	1
GEOL 4324, Geol. of Petroleum	3	PETR 4306, Adv. Reservoir Eng.	3
Elective (humanity)	6	PETR 4200, Petr. Prop. Eval.	2
		I E 3322, Engr. Eco. Anal.	3
	16		13

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 134.
*See Alternate Freshman Year.
†Exclusive of P.E., Band, or ROTC.

Courses in Petroleum Engineering. (PETR)

1305. Engineering Analysis I (3:3:0). Prerequisite: Enrollment in MATH 1350 or 1551. The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. FORTRAN programming. Synthesis and analysis of typical engineering problems.

3103. Production Laboratory (1:0:3). Prerequisite: Enrollment in PETR 3303. Experiments in reservoir characteristics, core analysis, oil recombination, corrosion, lease operation, pumping well characteristics, directional drilling, and fracturing design.

3201. Phase Behavior (2:2:0). Prerequisite: PETR 3301. Phase behavior of multiple-component hydrocarbon systems. Applications.

3202. Rotary Drilling Fluids (2:1:3). Prerequisite: PETR 3301. Characteristics of drilling fluids. Control and alteration of fluid characteristics. Effects on drilling processes.

3301. Petroleum Development Methods (3:3:0). Prerequisite: MATH 1351 or 1551. Petroleum and basic rock properties. Rotary drilling, casing, cementing, and oil well completion practices.

3302. Reservoir Rock Properties (3:3:0). Prerequisite: PETR 3301. A study of the physical properties of petroleum reservoir rocks as they relate to the production of oil and gas.

3303. Petroleum Production Methods (3:3:0). Prerequisite: PETR 3301. Oil well stimulation practices. Producing practices to include hydraulic and sucker rod pumping systems.

3304. Well Logging Methods (3:3:0). Prerequisite: PETR 3301 and enrollment in PHYS 2301, 1106. Well logging theory and techniques as applied to quantitative formation analysis. Field examples and problems.

4105. Natural Gas Laboratory (1:0:3). Prerequisite: Enrollment in PETR 4305. Natural gas analysis and testing; flow-metering devices; regulation and control devices.

4106. Reservoir Engineering Laboratory (1:0:3). Prerequisite: Enrollment in PETR 4303. Experimental work in fluid flow through porous media relating basic parameters to reservoir systems.

4121. Petroleum Engineering Seminar (1). Prerequisite: Advanced standing. Individual study of engineering problems of special interest and value to the student. May be repeated for credit.

4200. Petroleum Property Evaluation and Management (2:1:3). Prerequisite: PETR 4303. Economic, physical, and analytical evaluation of hydrocarbon producing properties, emphasizing relative worth of investments based on engineering judgment, using actual oil properties.

4303. Reservoir Engineering (3:3:0). Prerequisite: PETR 3201 and 3302. Fluid flow in porous media including unsteady-state flow; reservoir energy and producing mechanism; application of material balance in reservoir performance calculations.

4305. Advanced Natural Gas Engineering (3:3:0). Prerequisite: PETR 3201 and 3303. The production of natural gas and condensate reservoirs; processing, transportation, distribution, and measurement of natural gas and its derivatives.

4306. Advanced Reservoir Engineering (3:3:0). Prerequisite: PETR 4303. Frontal-advance theory and application; mechanics of secondary recovery processes; application to reservoir performance and analysis.

4331. Special Problems in Petroleum Engineering (3). Prerequisite: Advanced standing. Individual studies in advanced engineering areas of special interests. May be repeated for credit.

Department of Textile Engineering

James S. Parker, Chairperson; Christopher J. Lupton, Assistant Chairperson. Lecturers Foster, Lambert, Mehta, Price, Ragle, and Steadman.

This department supervises the following degree programs: TEXTILE TECHNOLOGY AND MANAGEMENT, *Bachelor of Science in Textile Technology and Management;* TEXTILE ENGINEERING, *Bachelor of Science in Textile Engineering.* Degree requirements appear in the accompanying curriculum table. The department also supervises the textile engineering aspects of research for interdisciplinary M.S. and Ph.D. degrees. For those interdisciplinary programs, graduate courses in textile engineering are provided.

Sharing quarters with the Department of Textile Engineering is the Textile Research Center. Staff members may hold joint appointments to the department and the center, thus providing a functional interface between the educational and

research programs. Excellent laboratory and pilot plant facilities are available for use by students in both the undergraduate textile technology and the graduate interdisciplinary programs.

Textile Technology and Management Curriculum.

FIRST YEAR

Fall		*Spring*	
MATH 1321, Trigonometry	3	T T 2300, Applied Textiles	3
MATH 1320, Coll. Algebra	3	ECO 2305, Prin. of Eco.	3
E GR 1306, Engr. Graphics	3	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1307, Prin. of Chem. I	3
POLS 2301, Amer. Govt., Org.	3	CHEM 1103, Prin. of Chem. I (Lab.)	1
P.E., Band, or ROTC		HIST 2300, Hist. of U.S. to 1877	3
		P.E., Band, or ROTC	
	15*		16*

SECOND YEAR

Fall		*Spring*	
PHYS 1306, Gen. Phys.	3	MATH 2300, Stat. Meth.	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	T T 2322, Prin. Fiber Proc. II	3
T T 2321, Prin. Fiber Proc. I	3	CHEM 3401, Intro. Org. Chem.	4
ACCT 2304, Ind. Acct. Engrs.	3	PHYS 1307, Gen. Phys.	3
CHEM 1308, Prin. of Chem. II	3	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
CHEM 1104, Prin. of Chem. II (Lab.)	1	POLS 2302, Amer. Pub. Pol.	3
Elective	3		
	17		17

THIRD YEAR

Fall		*Spring*	
T T 3311, Fiber Tech. Micro. I	3	I E 3201, Computer Prog. Tech.	2
T T 3335, Prin. Fabric Des. I	3	T T 3312, Fiber Tech. & Micro. II	3
MGT 3370, Organ. & Mgt.	3	T T 3336, Prin. Fabric Des. II	3
MKT 3350, Intro. to Mkt.	3	MGT 3374, Pers. Admin.	3
I E 3362, Safety Engr.	3	SCOM 3308, Bus. & Prof. Speech	3
		HIST 2301, Hist. of U.S. since 1877	3
	15		17

FOURTH YEAR

Fall		*Spring*	
T T 4331, Prob. in Text Engr.	3	T T 4121, Text. Tech. Sem.	1
T T 4341, Prin. Text. Fin. I	3	T T 4351, Test. & Qual. Contr.	3
BLAW 3391, Bus. Law I	3	T T 4342, Prin. Text. Fin. II	3
MGT 4372, Labor Relations	3	T T 4332, Prob. in Text. Engr.	3
MKT 4359, Sales Mgt.	3	MGT 3376, Beh. Sci. in Bus.	3
†Elective	3	†Elective	3
	18		16

Minimum hours required for graduation, exclusive of P.E., Band, or ROTC — 131.
*Exclusive of P.E., Band, or ROTC.
†Junior or senior level to be selected from management, marketing, industrial engineering, or textile technology.

Courses in Textile Technology. (T T)

2300. Applied Textiles (3:3:0). An introductory study of textile fibers, yarn manufacturing, fabric design, analysis and formation and textile finishing.

2321. Principles of Fiber Processing I (3:2:3). Fundamental principles and practices for processing cotton and man-made fibers into yarn. Analysis of machine operations and performance standards.

2322. Principles of Fiber Processing II (3:2:3). Prerequisite: TT 2321. Includes preparation of yarns to meet specific end uses. Correlation of machine performance capabilities of fundamental fiber properties.

3311. Fiber Technology and Microscopy I (3:2:3). Prerequisite: CHEM 3401. Physics and chemistry of polymers; growth, marketing and properties of natural fibers; microscopic examination of fibers.

3312. Fiber Technology and Microscopy II (3:2:3). Prerequisite: TT 3311. Polymerization techniques; production and properties of man-made fibers; cross sectioning and fiber identification.

3335. Principles of Fabric Formation, Design, and Analysis I (3:1:6). Prerequisite: TT 2322. Theory and practice in designing, forming, and analyzing plain and fancy fabrics. Laboratory study and engineering analysis of fabric forming mechanisms.

3336. Principles of Fabric Formation, Design, and Analysis II (3:1:6). Prerequisite: TT 3335. Theory and practice in designing, forming, and analyzing complicated fabric structures for special applications and engineering analysis of mechanisms for fabricating such structures.

3337. Technology and Design of Knitted Fabrics (3:2:3). Theory and practice in the formation of both weft and warp knit fabrics as applied to industrial, home furnishing, and apparel fabrics.

4121. Textile Technology Seminar (1). Prerequisite: Approval of department chairperson. Individual study of engineering problems of special interest. May be repeated for credit.

4331. Special Problems in Textile Technology (3). Prerequisite: Approval of department chairperson. Individual studies in advanced textile technology areas of special interest. May be repeated for credit.

4332. Special Experimental Problems in Textile Technology (3). Prerequisite: Approval of department chairperson. Individual experimental studies in current problems in advanced textile technology. May be repeated for credit.

4341. Engineering Principles of Textile Finishing I (3:2:3). Prerequisite: TT 3312, 3336. Water treatment and waste disposal; theory and practice of operations prior to dyeing.

4342. Engineering Principles of Textile Finishing II (3:2:3). Prerequisite: TT 4341. Elementary theory of color measurement; theory and practice in dyeing, printing, and finishing procedures.

4351. Textile Testing and Quality Control (3:2:3). Prerequisite: TT 3312, 3336, and MATH 2300. Instrumentation and test procedures for process control and product performance. Rigorous statistical treatment of test data and preparation of control charts.

4361. Textile Costing (3:3:0). Prerequisite: ACCT 2304 or equivalent; may be taken concurrently. Analysis of costs in textile production, including investment analysis. Sectional and integrated costing of textile products; depreciation; discounted cash flow and its applications.

College of Home Economics

Professor Elizabeth G. Haley, *Dean*

Texas Tech home economics programs at the baccalaureate, master's, and doctoral levels are innovative in focus, are relevant to the concerns of today's world, and are designed to prepare professionals — both men and women — for employment in broad career options of home economics. Graduates are employed in business, education, government, institutions, community agencies, and other organizations. In many of these diverse settings, the demand for qualified specialists within the field of home economics is greater than the supply.

The focus of home economics is on the individual, the family, and the interplay between families and their changing social and physical environments. The college provides professional preparation built upon an interdisciplinary knowledge base drawn from research in home economics; the arts; and the biological, physical, and social sciences.

The College of Home Economics is a professional college with the highest expectations for its graduates. Additionally, the college offers courses of significance to the general and professional education of students majoring in other colleges and provides continuing education for professionals in home economics related fields. Most undergraduate degree programs in home economics lead to the Bachelor of Science degree in Home Economics. Majors are offered in clothing and textiles with specializations in fashion design and merchandising; family management, housing, and consumer science with specializations in consumer studies and management, family finance, housing and interiors, and residential real estate; food and nutrition with specializations in general dietetics and business and merchandising; home economics education; home and family life with specializations in child development, teachers of young children, and family relations; and general home economics. The college also offers the Bachelor of Science in Restaurant, Hotel, and Institutional Management degree. For additional information about undergraduate degree programs in the various departments, see the following pages.

The College of Home Economics at Texas Tech has a sound curriculum, a well-qualified faculty, outstanding facilities, and a commitment to excellence. In addition to undergraduate majors, the college offers the Master of Science degree in Home Economics with majors in all departments and an interdisciplinary program leading to the Doctor of Philosophy degree in Home Economics. Specific information regarding graduate degrees may be found in the *Graduate Catalog*.

Academic Counseling. Each student in the college is assigned an academic advisor according to departmental policy. Students who have not selected a major will be assigned an advisor by the Dean of the College of Home Economics.

Admissions Policy. Any student entering Texas Tech who has been accepted by the undergraduate admissions office may enter the College of Home Economics. Students transferring into the College of Home Economics from

some other college on campus must meet the minimum academic standards of the University.

Course Load. Normally, students in the College of Home Economics carry a load of 16 to 18 hours per semester. Students who wish to enroll for a program of more than 18 or less than 12 semester hours must obtain special approval of the dean.

In a six-week summer term the maximum load is 7 semester hours, composed of two courses or three courses including a 1-semester-hour physical education activities course.

Aid to students. A number of student scholarships and assistantships, providing financial assistance as well as valuable experience to capable students, are available in home economics. Write to the Dean of the College of Home Economics, Box 4170, Texas Tech University, Lubbock, Texas 79409. Emphasis will be on leadership participation, high school grade average, and test scores.

Selection of a Major. Students should investigate all the programs available before selecting a major. The required freshman course, Professional Home Economics (H E 1101), will provide orientation to the total field and the many specializations available; therefore, it should be taken during the first semester on campus, if possible. Other freshman-level home economics courses will be helpful in clarifying career goals.

Students should follow the appropriate curriculum outline in planning a schedule and should seek consultation from an advisor. Before the close of the junior year, remaining degree requirements should be carefully checked in the dean's office.

Pass-Fail. A maximum of 13 hours may be taken pass-fail. Up to 9 hours of lower division courses may be chosen from physical education, history, political science, and the remaining pass-fail courses may be chosen from free electives (not to include courses in home economics or in the minor).

If an ineligible course is taken pass-fail, it must be replaced by the next higher course. Pass-fail hours are excluded in determining eligibility for the Dean's Honor List. No student on probation is allowed the pass-fail option.

Academic Standards and Requirements. Minimum standards and requirements of the College of Home Economics are the same as those for the University. Other requirements include the following:

1. Required freshman-level and sophomore-level courses should be taken during the freshman and sophomore years.
2. To meet graduation requirements, a student must take a minimum of 54 semester hours of course work in upper-level courses (3000- and 4000-level).
3. A student may graduate under the requirements of the catalog current at the time the major was declared, or a student may elect to fulfill the academic requirements cited in a later catalog.
4. Students must file a "Statement of Intention to Graduate" with the dean's office before or during the semester in which they are enrolled for the 96th semester hour. After filing the application, the catalog designated for graduation cannot be changed. Substitutions must also be filed prior to or during the semester the student is enrolled for the 96th semester hour.

5. Students who have taken 3000- and 4000-level courses in a subject area may not take 1000- and 2000-level courses in that subject area for credit nor apply for credit by examination at the 1000- or 2000-level. A maximum of 6 semester hours may be earned in the major field through credit by examination.

6. Students should have completed lower-level (1000- and 2000-level) courses and must have at least a 2.00 overall GPA to enroll in an internship or practicum.

7. All grades earned while enrolled at Texas Tech are used in calculating the grade-point average for meeting graduation requirements.

General Degree Requirements of the College of Home Economics. The College of Home Economics offers work leading to the degree of Bachelor of Science in Home Economics with a major in clothing and textiles; family management, housing, and consumer science; food and nutrition; home economics education; or home and family life; or general home economics. Additionally, the college offers the Bachelor of Science in Restaurant, Hotel, and Institutional Management degree. The general requirements of the College of Home Economics for all programs are summarized in the three groups below. In the following section the special requirements for each program are indicated.

I. Academic Foundation: 45 to 50 semester hours
Required foundation courses include ENGL 1301, 1302 and 2301 or 2309; 2 hours of P.E. activity; POLS 2301 and 2302; HIST 2300 and 2301; SOC 1301 or 1320; and BIOL 1402 or ZOOL 2403. Biology, chemistry, economics, entomology, geography, geology, mathematics, physics, psychology, and sociology may be used to satisfy science electives. Each area of specialization (especially those in home economics education) should be checked for specific science requirements.

II. Home Economics Core: 17 semester hours
H E 1101, HEED 4102, and one course from each of the following areas as designated by specialization choice: clothing and textiles, food and nutrition, management and consumer studies, child development, family relations, and home economics education.

III. Additional required and elective courses as specified in major degree programs to complete a minimum of 127 semester hours for graduation. (Degree programs vary in requirements from 127 to 133 semester hours.) The various areas of specialization meeting degree requirements are described by each department, followed by tables of specific course requirements.

Prenursing. Students desiring admission to the Texas Tech University Health Sciences Center School of Nursing should apply directly to that program.

Students seeking admission to either diploma or collegiate programs in nursing, other than at Texas Tech University, may enroll in the prenursing curriculum within the College of Home Economics. A counselor in the college assists students in selecting appropriate courses.

In general, two routes are open to prospective nursing students who come to Texas Tech University. (1) The student may take one or two years of academic college courses prior to transferring to a college or university (other than Texas Tech) offering a Bachelor of Science degree

in Nursing, or (2) the student may prepare to qualify for admission to one of the two-year diploma programs of nursing in a hospital school of nursing.

In order to avoid complications in transfer, prenursing students should not take courses pass-fail.

Courses in Home Economics. (H E)

1101. Professional Home Economics (1:1:0). An exploration of home economics as an academic discipline and profession. To be taken early in a student's college program and prior to declaration of a major.

2000. Special Studies (V1-6). A course for lower-level home economics majors for individual study or special problems.

4000. Individual Study (V1-6). May be repeated for up to 6 hours credit.

Department of Clothing and Textiles

Associate Professor Patricia Horridge, Chairperson.
Associate Professors Gerlach, Morrow, Timmons, and Woodson; Assistant Professors Harp, Khan, Richards, and Stretch; Instructor Kountz; Adjunct Professor Lupton; Part-time Lecturer Pool.

This department supervises the following degree programs: CLOTHING AND TEXTILES, *Bachelor of Science in Home Economics* and *Master of Science in Home Economics*. Instruction is designed to prepare graduates for careers in the many aspects of the clothing and textile industry, teaching clothing and textiles or, with a supportive background, consumer services. A student in another college may minor in this department by completing 18 hours selected in conference with the department chairperson.

Clothing and Textiles Programs.

A. Clothing and Textiles — General

The general clothing and textiles major offers an adaptable curriculum that facilitates the development of individualized aptitudes and interests. The program is designed for those who desire a flexible course of study leading to a wide selection of clothing and textiles career options.

B. Specializations

Fashion Design. A flexible curriculum is offered to develop creativity, provide a background of knowledge of the fashion industry, and relate apparel design to human needs. Custom design or design for mass production may be pursued as well as fashion promotion and consumer services. Sufficient electives enable the student to minor in art, foreign language, marketing, mass communications, or other subjects.

Merchandising. The merchandising plan combines an understanding of the fashion industry with an understanding of business principles. Courses from the College of Business Administration provide the basic courses on business principles, while courses within the department focus on the interplay between consumers and the textile and apparel industries as well as on merchandising functions.

Clothing and Textiles Curriculum.

General Clothing and Textiles		Fashion Design		Merchandising	
Basic Curriculum	**Requirements for Specialization**	**Basic Curriculum**	**Requirements for Specialization**	**Basic Curriculum**	**Requirements for Specialization**
FIRST YEAR					
ENGL 1301, 1302 MATH 1300 Sci. or Math. — 6 hrs. P.E., Band, or ROTC — 2 sem.	H E 1101 C D 2303 C&T 2301, 2303 F&N 1310 FMHC 1370 or 3370	ENGL 1301, 1302 Sci. or Math. — 6 hrs. P.E., Band, or ROTC — 2 sem.	H E 1101 C D 2303 C&T 2307 F&N 1310 FMHC 1370 or 3370 ART 1324, 1325	ENGL 1301, 1302 MATH 1330, 1331 P.E., Band, or ROTC —2 sem. FMHC 1370 or 3370	H E 1101 C D 2303 C & T 2301 C&T 2303 or 2307 F&N 1310
SECOND YEAR					
ENGL 2301, 2302 HIST 2300, 2301 ZOOL 2403 or BIOL 1402 SOC 1301 POLS 2301, 2302 Guided elec./collateral (lower level) — 6 hrs.	Cloth. & Text. elec. — 3 hrs. (guided/lower level)	ENGL 2301, 2302 HIST 2300, 2301 ZOOL 2403 or BIOL 1402 SOC 1301	C&T 2301, 2303 ART 1320, 1331	ENGL 2301, 2302 HIST 2300, 2301 ZOOL 2403 or BIOL 1402 ECO 2311, 2312 POLS 2301, 2302 ACCT 2300 or 2303 ISQS 2340 or C S 1302	
THIRD YEAR					
Guided elec. (lower level) — 3 hrs. Sci. or Math — 3 hrs. Guided elec./collateral (upper level) — 6 hrs.	F R 3320 HEED 3303 Cloth. & Text. elec. — 12 hrs. (guided/upper level)	POLS 2301, 2302 Sci. or Math. (upper level) — 6 hrs.	C&T 3306, 3307 Cloth. & Text. elec. (upper level) HEED 3303 F R 3320 Elec. (upper level) — 6 hrs.	MKT 3350, 3353, 4351	SOC 2301 or 2320 C&T 3301 or 4331 C&T 3360, 3370 HEED 3303 Elec. (upper level) — 6 hrs. F R 3320
FOURTH YEAR					
Guided elec. (upper level) — 6 hrs. Guided elec./collateral (upper level) — 6 hrs.	C&T 4370 HEED 4102 Cloth. & Text. elec. — 15 hrs. (guided/upper level)		C&T 4303, 4304, 4307, 4390, 4391 HEED 4102 Elec. (upper level) — 15 hrs.		C&T 4304, 4350, 4360, 4370 4380, 4390, 4391 C&T 4303 or 4308 Cloth. & Text. elec. (upper level) HEED 4102 Elec. (upper level) — 3 hrs.
TOTAL	**128 hrs.**		**128 hrs.**		**128 hrs.**

C. Double Major

The double major option combines the requirements of two specializations within the College of Home Economics.

The following requirements apply to majors in the department.

Students must complete all lower division courses with a minimum 2.00 cumulative GPA before advancing to the upper division.

An internship is required of each student specializing in merchandising or fashion design. The internship experience is jointly planned by the department and the student. Application should be made through the student's advisor one year prior to the semester in which the internship is planned. Senior standing and a 2.00 cumulative GPA are prerequisites. The internship courses (C&T 4390 and 4391) are available in the fall and summer only. A laboratory fee is required.

For the internship in merchandising, a grade of C or higher must be earned in C&T 4304, 4360, 4370, and MKT 4351 as well as in the prerequisites for these courses (C&T 3360, 3370, and MKT 3350, 3353).

For the internship in fashion design, a grade of C or higher must be earned in C&T 3306, 3307, and 4304.

Courses in Clothing and Textiles. (C&T)

1330. Consumer Problems in Clothing (3:3:0). Sociopsychological and aesthetic aspects of fashion and textiles pertaining to the acquisition and care of apparel for the family. Designed for both men and women.

2301. Textiles for the Consumer (3:3:0). Selection, use, and care of textiles in relation to fiber composition, yarn and fabric structure, color and finish.

2303. Introductory Clothing and Construction (3:1:4). Pattern selection, alteration, fitting, coordinating dress-weight fabrics and component parts by the application of couture techniques.

2307. Apparel Design (3:1:4). Introduction to three basic methods of apparel design and their interrelationships. Creative problems are solved through illustration, flat pattern, and draping half-scale figures.

3000. Creative Design (VI-3). Prerequisite: C&T 2303 and/or 2307. Current technology and promotional methods applied to creative apparel designs. May be repeated for credit up to 12 hours.

3301. Textile Fabrics: Properties and Performance (3:1:4). Prerequisite: C&T 2301. Physical and chemical properties of fibers, dyeing and finishing, fabric performance,

3302. Dressmaker Tailoring (3:1:4). Prerequisite: C&T 1330 or 2301, and 2303.

3304. Family Clothing (3:3:0). Prerequisite: Consent of instructor. Basic philosophy of dress in the American culture; wardrobe planning and buying procedures for family members with emphasis on children's clothing.

3306. Flat Pattern Design (3:1:4). Prerequisite: C&T 2303, 2307, or consent of instructor. Application of flat pattern techniques in designing. May be repeated for credit up to 6 hours.

3307. Apparel Design II (3:1:4). Prerequisite: C&T 2307 and ART 1320, 1324, 1325, 1331. Methods of creative expression and communication in intermediate apparel design.

3330. Fashion Study (3:3:0). Fashion study and tours of manufacturing/fashion/merchandising centers including professional visits to retail stores, design houses, and textile factories and cultural visits to museums and historical sites.

3360. Merchandising of Clothing and Textiles (3:3:0). Prerequisite: Junior standing. Problems encountered in the merchandising of clothing and textile products.

3370. Merchandise Planning and Control (3:3:0). Prerequisite: C&T 3360, ACCT 2303; ISQS 2340 or C S 1302. Analyzing the inherent practices of merchandising to reflect departmental capital and stock utilization keeping profits consistent with space, time, and money.

4303. History and Philosophy of Dress (3:3:0).

4304. Fashion Fundamentals (3:3:0). Prerequisite: Junior standing. Analysis of fashion relative to social, psychological, and economic change. Significance of fashion to merchandising.

4307. Apparel Design for Mass Production (3:1:4). Prerequisite: C&T 3307 and 3306 or consent of instructor. Design of apparel through flat pattern and draping methods; drafting and grading of patterns; use of commercial power sewing equipment; study of factory production and distribution techniques. May be repeated for credit up to 6 hours.

4308. Historic Textiles (3:3:0).

4330. Problems in Upholstery (3:1:4). Consumer problems in upholstered furniture; finishing or refinishing chair frame and upholstering; emphasis on preparation for teaching paraprofessionals at the secondary level.

4331. Contemporary Textiles for Nonapparel Use (3:2:2). Investigation of contemporary textiles used in nonapparel items as related to consumer problems of selection and care.

4350. Problems in Merchandising of Clothing and Textiles (3). Prerequisite: C&T 3360. Directed individual study through programmed learning with emphasis on problem solving using case studies and examples of merchandising enterprises.

4360. Fashion Merchandise Management (3:3:0). Prerequisite: C&T 3360, 3370. Fundamental principles related to the management processes of buying and selling textile and apparel products and supervising personnel merchandising fashion products.

4370. Visual Merchandising (3:2:2). Prerequisite: Junior standing or consent of instructor. Problems in communication through display, demonstrations, and related media for careers in merchandising.

4380. Textile and Clothing Economics (3:3:0). Prerequisite: ECO 2311 and 2312 or equivalent and C&T 3360. Study of economics of textile and clothing production and the world-wide market, with emphasis on the United States textile and apparel industry.

4390, 4391. Internship in Merchandising or Fashion Design (3:1:6 each). Prerequisite: Departmental approval and for merchandising—C&T 4304, 4360, 4370, MKT 4351; fashion design—C&T 3306, 3307, 4304. Applied problems in clothing and textiles emphasizing student participation in business or industry.

Department of Family Management, Housing, and Consumer Science

Associate Professor A. William Gustafson, Acting Chairperson.
Professor McKown; Associate Professors Ater and Logan; Assistant Professors Davis, House, and Schrock; Instructor Shroyer.

This department supervises the following degree programs: FAMILY MANAGEMENT, HOUSING, AND CONSUMER SCIENCE, *Bachelor of Science in Home Economics* and *Master of Science in Home Economics; Doctor of Philosophy* in HOME ECONOMICS with an option in Family Management, Housing, and Consumer Science.

Various positions are available in private business, governmental agencies, or social service programs for students in family finance, residential real estate, con-

sumer science, or housing and interiors. The housing and interiors specialization offers careers in specification, coordination, or illustration of the living environment. Students specializing in housing and interiors take field trips to the Dallas market where they meet with professionals in the field.

An internship is required in all undergraduate specializations. Depending on the student's career goal, the internship may include real estate firms, consumer protection organizations, lending institutions, architectural firms, or interior design studios.

A student in another college may attain a minor in one of the departmental areas by completing 18 hours in specified courses. Students interested in pursuing a minor must have the approval of the academic dean and the chairperson of the department.

A grade of C or higher must be earned in all major courses.

Family Management, Housing, and Consumer Science Specializations.

1. *Consumer Studies and Management.* Graduates are prepared for employment in consumer-related positions in business, the extension service, and consumer protection organizations, as well as consumer specialists. Theoretical and practical management of material and human resources are emphasized.
2. *Family Finance.* Students are prepared for family financial counseling in financial institutions, governmental/social agencies, and the extension service. The multidisciplinary plan which includes courses in accounting, finance, economics, and sociology provides for a minor in finance. The plan also affords a sound academic background for future graduate study in family financial counseling.
3. *Housing and Interiors.* This field is designed for students interested in interior design and housing. Practical application of multidisciplinary principles to commercial and residential interior environments are emphasized. Problem-solving processes are stressed.
4. *Residential Real Estate.* This area emphasizes family characteristics and housing needs as well as the financial and legal aspects of real estate transactions. The plan includes a minor in business administration as well as aesthetic, functional, and financial issues in housing.

Courses in Family Management, Housing, and Consumer Science. (FMHC)

1370. Introduction to Management and Consumer Studies (3:3:0). Introduction and application of basic personal management concepts, including motivational factors, decision systems, environmental influences, consumer needs, and human and material resource use.

1380. Introduction to Housing and Interiors (3:3:0). A survey of basic principles, concepts, and processes relevant to the house and its interior elements.

1382. Interiors I (3:1:4). Introduces skills necessary to design, analyze, and present professional interior design statements. Course content includes creative problem solving and development of working drawings, floor plans, and elevations.

Family Management, Housing, and Consumer Science Curriculum.

Consumer Studies and Management		Family Finance	
Basic Curriculum	**Requirements for Specialization**	**Basic Curriculum**	**Requirements for Specialization**
	FIRST YEAR		
ENGL 1301, 1302 MATH 1330 or 1331 Sci. or Phys. elec. — 3 hrs. P.E., Band, or ROTC — 2 sem.	H E 1101 C D 2303 C&T 1330 or 2301 F&N 1310 or 2310 FMHC 1370	ENGL 1301, 1302 MATH 1330, 1331 SOC 1301 Sci. — 3 hrs. P.E., Band, or ROTC — 2 sem.	H E 1101 C D 2303 C&T 1330 F&N 1310 or 2310 FMHC 1370
	SECOND YEAR		
ENGL 2301 or 2302 or 2309 HIST 2300, 2301 POLS 2301, 2302 HUM 2301 or 2302 ECO 2305 ZOOL 2403 SOC 1301	FMHC 2370, 2372 F R 2320	ENGL 2301 or 2302 or 2309 HIST 2300, 2301 POLS 2301, 2302 HUM 2301 or 2302 ECO 2311 ZOOL 2403	ACCT 2300, 2301, 2445 FMHC 2370 or 2372 ISQS 2445
	THIRD YEAR		
AECO 3401 or MATH 2300 ISQS 2445	FMHC 3370, 3373, 3380, 3381 MKT 3350, 3391 F R 3320 BLAW 3391 Guided elec. (upper level) — 9 hrs.	ECO 2312 SOC 3321 or 3339 or 3331 or 3352	FMHC 3370, 4347 F R 3320 FIN 3320, 3373, 3391 BLAW 3391 Guided elec. — 6 hrs.
	FOURTH YEAR		
	HEED 3303, 4102 FMHC 4307, 4374, 4375, 4376, 4377 MKT 3352 SOC 3332 ADV 3310, 3366	ECO 4301	F R 3322 or 4331 or 4332 HEED 3303, 4102 FMHC 4307, 4375, 4376, 4380 Elective — 3 hrs. MGT 3323, 4323
TOTAL	**130 hrs.**		**131 hrs.**

2370. Management of Family Resources (3:3:0). Prerequisite: FMHC 1370 or equivalent. Enhancement of the quality of life through management of family and environmental resources. Application of family management theory through supervised practicum experiences.

2372. Consumer Problems I (3:3:0). A foundation course involving the history and philosophies of various consumer movements as well as a general survey of current consumer problems.

2380. Interior Environmental Analysis (3:3:0). Interaction between environment and people, including the influence of space, objects, and materials in a living environment.

2383. Interiors II (3:1:4). Prerequisite: FMHC 1382 or equivalent. Graphic media application in interior design renderings and presentation methods. Perceptual development in use of color, line, light, shading, and spatial organization.

3370. Family Finance and Consumer Education (3:3:0). Principles of family finance and implications for consumer management of credit, insurance, investments, estate planning, housing, transportation, taxation, and leisure.

3373. Housing and Interiors Equipment (3:3:0). Decision-making with regard to operation and maintenance of interior equipment, including lighting, as related to the function and design of the home in contemporary society, includes the application of selected principles of basic physics and chemistry.

Family Management, Housing, and Consumer Science Curriculum.

Housing and Interiors		Residential Real Estate	
Basic Curriculum	**Requirements for Specialization**	**Basic Curriculum**	**Requirements for Specialization**
	FIRST YEAR		
ENGL 1301, 1302 Sci. — 6 hrs. P.E., Band, or ROTC — 2 sem. Math elec.	H E 1101 FMHC 1380, 1382 F&N 1310 ART 1310, 1311, and 1320 ARCH 1341	ENGL 1301, 1302 MATH 1330, 1331 ECO 2311, 2312 Sci. — 3 hrs. P.E., Band, or ROTC — 2 sem.	H E 1101 F&N 1310 C&T 1330 or 2301 FMHC 1370
	SECOND YEAR		
ENGL 2301 or 2302 HIST 2300, 2301 POLS 2301, 2302 ECO 2305 ZOOL 2403 or BIOL 1402 SOC 1301	C D 2303 C&T 2301 FMHC 2380, 2383	HIST 2300, 2301 POLS 2301, 2302 ENGL 2301 or 2302 SOC 1301 ZOOL 2403	FMHC 1380 C D 2303 ACCT 2300, 2301
	THIRD YEAR		
	ARCH 3201 — 4 hrs. FMHC 3373, 3380, 3381, 3382 FMHC 3370 or 4375 FMHC 3384 — 6 hrs. F R 3320 ARCH 3311 or 3312 PHOT 2301 MKT 3350	ECO 3311 AECO 3401 or ISQS 2445	FMHC 2370 or 3373 FMHC 3370, 3381 FIN 3320, 3332, 3323, 3334 F R 3320 Elective — 4 hrs.
	FOURTH YEAR		
	HEED 3303, 4102 FMHC 4307, 4380 FMHC 4384 — 6 hrs. Guided elec. (upper level) — 6-9 hrs.	AECO 4303	FMHC 4307, 4375, 4380 MKT 3350 MGT 3370 BLAW 3393 FIN 4333 Elective — 3 hrs. HEED 3303, 4102
TOTAL	**135 hrs.**		**133 hrs.**

3380. Purchase and Use of Interior Components (3:3:0). Problem solving in selection, use, and care of interior components. Cost estimating, product and material specification writing, aesthetic and construction features, safety considerations, and barrier-free requirements are included.

3381. Residential Housing and Interiors (3:2:2). Interrelationships between the sociocultural, psychological, and physical environments in residential housing and interiors. Course content also includes computer-aided anthropometric analysis, space planning, construction, mechanical systems, and building codes.

3382. Period Furnishings (3:3:0). Introduction to furniture concepts and features of distinction including ancient to currently emerging design and construction. Emphasis on the evolution of form, relationships to previous periods.

3384. Problems in Housing and Interiors (3:1:4). Prerequisite: FMHC 2383 or equivalent. Utilization of component information and development and application of specification writing skills, presentation skills, and problem solving techniques relevant to current issues in housing and interiors.

4307. Internship in Family Management, Housing, or Consumer Science (3:1:6). Prerequisite: 9 hours in family management, housing, or consumer science or consent of instructor. Supervised intern experiences in established career-

related positions; participation in business methods and professional practices. May be repeated for credit.

4373. Advanced Household Equipment (3:3:0). Prerequisite: FMHC 3373. New developments in home equipment, residential lighting, air-conditioning, practicum experience, and demonstration and planning for homemakers with physical and financial limitations.

4374. Consumer Redress (3:3:0). Prerequisite: FMHC 2372 or equivalent. Survey of function, role, and methods of consumer redress procedures used in the marketplace.

4375. Consumer Problems II (3:3:0). Analysis of consumer problems relative to prevalent marketing techniques, ethical questions, and alternative consumer behavior.

4376. Decision Making in Family Management (3:3:0). Prerequisite: 6 hours in family management, housing, and consumer science or consent of instructor. Application of managerial principles and concepts relevant to a variety of contemporary family problems.

4377. Consumer Policy Seminar (3:3:0). Prerequisite: Senior standing. Analysis of current policies affecting consumers in the areas of housing, food, clothing, energy, and other selected concerns. May be repeated for credit.

4380. Advanced Housing for the Family (3:3:0). Current trends in family housing, including community and city housing developments, legal and financial aspects of family housing, and technological changes affecting the family's living environment and housing needs.

4384. Projects in Interior Planning (3:1:4). Prerequisite: FMHC 3384. Advanced experiences integrating and extending knowledge and skills in working drawings, design methods, space planning, programming, specifying, and problem solving. Residential and nonresidential projects are critiqued by practicing professionals. Majors should repeat for 6 hours.

Department of Food and Nutrition

Professor Shiang Ping Yang, Acting Chairperson.
Associate Professors Brittin, Hayes, McPherson, Spallholz, and Stoecker; Assistant Professors Fox, Harden, and Huffman; Instructor Perkins; Part-time Instructors Hoffman, Pietz, and Schrock.

This department supervises the following degree programs: FOOD AND NUTRITION, *Bachelor of Science in Home Economics, Master of Science in Home Economics; Doctor of Philosophy* in HOME ECONOMICS with an option in Food and Nutrition; RESTAURANT, HOTEL, AND INSTITUTIONAL MANAGEMENT, *Bachelor of Science in Restaurant, Hotel, and Institutional Management.* In addition, the department offers a 10-month post-baccalaureate general dietetic internship.

These programs emphasize the increasingly important role of food and nutrition in the personal lives of people as well as in the operation of institutions of many types, such as hospitals, schools and colleges, industries, and military establishments. The newly established Lamb Nutritional Assessment Laboratory greatly enhances the program offerings. The aim of the department is to provide majors with a sound foundation for professional careers in food and nutrition and to contribute to the liberal education of all students who enroll in departmental courses.

The Restaurant, Hotel, and Institutional Management (RHIM) program prepares students for job opportunities in the hospitality industry. This includes work in the areas of business administration, foods and nutrition, arts and sciences, and core courses in RHIM. The curriculum is keeping pace with changes in the hospitality field by providing up-to-date classroom and laboratory learning experiences. The philosophy of RHIM is to prepare well-trained professionals for a creative and innovative industry.

An advanced placement examination for F&N 1310 is available prior to student registration. A satisfactory competence score results in 3 semester hours credit.

Restaurant, Hotel, and Institutional Management Major. Texas Tech's RHIM program offers a mutidisciplinary approach to hospitality education. The curriculum is designed to prepare the student to meet both current and future hospitality needs. The program emphasizes probelm solving and creativity in addition to strong hands-on laboratory experiences.

Food and Nutrition Specializations.

A. General Dietetics

The dietetics specialization meets academic requirements for admission to approved dietetic internships. Completion of the internship or other ADA-approved experiences qualifies the student for membership in the American Dietetic Association and for eligibility to take the registration examination.

The plan emphasizes the nutritional care and education of people and prepares students to qualify for positions in hospitals, community agencies, and food service systems with the prime responsibility of improving and maintaining the nutritional status of people.

B. Business and Merchandising

Combining food and nutrition with courses in communications and business provides the academic background for students who wish to prepare for careers with food, beverage, and equipment companies, restaurants, food associations, advertising agencies, utility companies, magazines, or newspapers. Such a career involves product development, writing and editing for the various mass media, marketing, and other consumer service and public relation activities.

To enhance employment opportunities, individualized elective programs may be developed with a faculty advisor in such areas as business administration and mass communications.

Double Major. Any specialization in food and nutrition may be combined with the requirements for a major in other areas. The number of hours required for graduation depends upon the specialization chosen.

Courses in Food and Nutrition. (F&N)

1301. Nutrition for Today (3:3:0). A survey course for non-home economics majors with current information on nutrition, dieting, additives, food consumption patterns, nutritional labeling, food regulations, and world food problems.

1310. Nutrition and Food (3:2:2). Science of nutrition and food as applied to everyday living.

2310. Principles of Food Preparation (3:2:2). Application of scientific principles to food preparation.

Food and Nutrition Curriculum.

Business and Merchandising		General Dietetics	
Basic Curriculum	**Requirements for Specialization**	**Basic Curriculum**	**Requirements for Specialization**
FIRST YEAR			
ENGL 1301, 1302 CHEM 1305, 1306, 1101, 1102 P.E., Band, or ROTC — 2 sem. MATH 1320 MCOM 1300	H E 1101 C&T 1330 or 2301 FMHC 1370 F&N 1310	ENGL 1301, 1302 CHEM 1305, 1306, 1101, 1102 P.E., Band, or ROTC — 2 sem. MATH 1320	H E 1101 C&T 1330 FMHC 1370 F&N 1310, 2310 Fine Arts elec.
SECOND YEAR			
HIST 2300, 2301 POLS 2301, 2302 ECO 2305 ENGL 2309 SOC 1320 ZOOL 2403	F&N 2310 C D 2303 Fine Arts elec. ACCT 2303	HIST 2300, 2301 POLS 2301, 2302 ECO 2305 ENGL 2309 SOC 1320 ZOOL 2403 ANTH 2302	F&N 3310, 3360, 3370 C D 2303
THIRD YEAR			
JOUR 3309 SCOM 3308 ADV 3310 or 3311 MKT 3350 MGT 3373	F&N 3101, 3102, 3360, 3370 F&N 3310, 3340 FMHC 3373 or ANSC 3101, 3201 F R 3320	CHEM 3401, 3402 I E 3303 MGT 3370	F&N 3101, 3102, 3340 RHIM 3490 F R 3320 Elec. — 2 hrs.
FOURTH YEAR			
MBIO 3400	F&N 4301, 4310, 4360, 4380 HEED 3303, 4102 H E 4000 Elec. — 6 hrs.	MBIO 3400	F&N 4120, 4130, 4320, 4330, 4360, 4440 HEED 3303, 4102 H E 4000 Elec. — 6 hrs.
TOTAL	**131 hrs.**		**131 hrs.**

Restaurant, Hotel, and Institutional Management Curriculum.

Basic Curriculum	Requirements for Major	Basic Curriculum	Requirements for Major
FIRST YEAR		**THIRD YEAR**	
ENGL 1301, 1302 Chem., Biol., Phys., or Zool. — 8 hrs. P.E., Band, or ROTC —2 sem.	H E 1101 F&N 1310, 2310 RHIM 2110, 2308 Elec. — 6 hrs.	F&N 3360, 3101, 3370, 3102 ANSC 3201, 3101 I E 3320 Elec. — 3 hrs.	MGT 3370, 3374 BLAW 3391 RHIM 3100, 3308, 3490
SECOND YEAR		**FOURTH YEAR**	
MATH 1330, 1331 HIST 2300, 2301 POLS 2301, 2302 F R 2320 ECO 2305	ACCT 2300, 2301 Elec. — 3 hrs.	HEED 4102 FMHC 3380 FD T 3303 ACCT 3301 MGT 4370	RHIM 4312, 4313 4315, 4316 Elec. — 6 hrs.
TOTAL			**131 hrs.**

3101. Practicum I in Management (1:0:3). Concurrent with F&N 3360. Practicum in Food Systems Management I. May be repeated once for credit.

3102. Practicum II in Management (1:0:3). Concurrent with F&N 3370. Practicum in Food Systems Management II. May be repeated once for credit.

3310. Meal Management (3:2:2). Management of time, money, energy, and equipment in planning, purchasing, preparing, and serving nutritious and satisfying family and guest meals.

3320. Nutrition and Diet Therapy for Allied Health Professionals (3:3:0). Prerequisite: ZOOL 2403 or consent of instructor. Principles of nutrition and diet therapy as applied to frequently encountered health problems. For nursing, pre-med, and other allied health students.

3340. Human Nutrition (3:3:0). Prerequisite: Human anatomy and physiology. Physiological functioning of nutrients, their availability, and emphasis in menu and dietary planning: dietary analysis as a tool in teaching and in research.

3350. Child Nutrition (3:3:0). Nutritional needs of young children in relation to mental and physical development; cultural, social, and psychological aspects of food and dietary patterns.

3360. Food Systems Management I (3:2:3). Prerequisite: F&N 2310 or consent of instructor. Application of scientific food preparation and management principles to quantity food production. Includes laboratory experiences in quantity operations and related facilities.

3370. Food Systems Management II (3:2:3). Prerequisite: F&N 3360. The role and responsibilities of management in food service. Emphasis on understanding and optimum use of human, financial, and material resources. Laboratory experiences in commercial food operations.

4120. Scientific Terminology in Dietetics (1:1:0). Prerequisite: Basic courses in physiology, chemistry, and nutrition. Terminology in describing normal anatomical, physiological and psychological conditions and those related to disease and its treatment for students entering allied health professions.

4130. Field Work in Food and Nutrition (1:0:3). Preplanned experiences with evaluation of student performance in hospitals, community health centers, clinics, and volume feeding establishments. May be repeated for credit.

4301. Food and the Consumer (3:3:0). Prerequisite: Junior standing. Technological advances and practices in food production, preservation, processing, and merchandising.

4310. Demonstration Techniques (3:1:4). Prerequisite: F&N 2310 or consent of instructor. Study, observation, and practice of demonstration methods used in the home economics and merchandising fields.

4320. Advanced Human Nutrition (3:3:0). Prerequisite: Physiological chemistry; F&N 3340. Concepts of normal nutrition in relation to the chemistry and physiology of the human body.

4330. Community Nutrition (3:3:0). The nutritional status and needs of groups of people in a community including preschool and school children, welfare cases, the aged, and the culturally deprived.

4360. Experimental Methods with Food (3:1:6). Prerequisite: F&N 2310 and chemistry. Investigation of the chemical and physical factors influencing quality in food; consideration of proportions, manipulations of ingredients, and additives in preparation.

4380. Cultural Aspects of Food (3:3:0). Prerequisite: Junior standing or consent of instructor. A study of the historical, social, psychological, economic, religious, and aesthetic significance of food customs in various cultures.

4440. Diet Therapy (4:4:0). Prerequisite: F&N 4320 and physiological chemistry. Physiological and biochemical abnormalities in certain diseases, and principles underlying nutritional therapy.

Courses in Restaurant, Hotel, and Institutional Management. (RHIM)

2110. Introduction to Hospitality Management (1:1:0). Analyzes the nature of work, people, and the interrelationships within the hospitality industry.

2308. Hotel Operations (3:3:0). Principles and practices of managerial functions relating to the operation of hotel/motel facilities.

3100. Practicum (1:0:3). Prerequisite: 6 hours of RHIM courses. In-service training and practical experience totaling at least 300 hours in an approved food service or lodging operation.

3308. Hotel Convention Sales and Catering Management (3:3:0). Prerequisite: F&N 2310, 3360, 3101. Emphasis on the function of the convention sales and services department related to hotel/motel operation. Explores factors involved in large group hotel sales.

3490. Development, Procurement, and Utilization of Resources (4:3:3). Factors affecting design, selection, physical facilities, and utilities involved in food service equipment. Current economic, legislative, commercial, and industrial developments related to quantity food purchasing.

4312. Beverage Control Management (3:2:3). Selection, storage, and service of beverages with emphasis on inventory control, sales promotion, and profits.

4313. Legal Aspects of Hospitality Industry (3:3:0). A study of the laws applicable to restaurants, hotels, and associated businesses. Includes duties, rights, and liabilities of institutions and guests.

4315. Advanced Food Production Management (3:1:6). Assumption of maximum responsibility of the management of an actual food service operation based on sound managerial principles and successful food production and service techniques.

4316. Hospitality Management Marketing (3:3:0). Prerequisite: MGT 3376 or MKT 3350. Application of marketing concepts, methods, and techniques used in the hospitality industry. Analysis of principles of consumer behavior, market research, promotion, and marketing strategy.

Department of Home Economics Education

Professor Jean Camille G. Bell, Chairperson.
Professor Chamberlain; Associate Professors Boswell and M. Cummings; Assistant Professors Couch and P. Cummings.

This department supervises the following degree programs: HOME ECONOMICS EDUCATION, *Bachelor of Science in Home Economics and Master of Science in Home Economics; Doctor of Philosophy* in HOME ECONOMICS with an option in Home Economics Education.

These programs are designed primarily for those who plan a career in teaching vocational home economics in secondary schools. In addition, basic preparation is given for careers in the Extension Service, business, youth programs, and in other home economics fields. A broad base is provided and includes courses in every area of home economics.

Teacher Education. Persons completing the B.S. degree in home economics with a major in home economics education have met the legal requirements of Texas for a provisional certificate for vocational home economics education. Personal application for the certificate is made through the Department of Home Economics Education. Transfer students who wish to be recommended for certification must complete at least 3 semester hours at Texas Tech in each of the subject matter departments in home economics. This requirement may be increased on the recommendation of the faculty of the Department of Home Economics Education.

The professional education sequence begins the first semester of the junior year. The standards for admission to a program leading to teacher certification are given in detail in the section entitled Teacher Education.

Student Teaching. A large number of regional secondary schools cooperate with the University in its student teaching program for home economics education majors. Prior to student teaching, opportunities in teaching unique audiences are given to majors. An overall grade-point average of 2.25 or above is required for admission into the student teaching program. Other prerequisites are shown under Teacher Education admission standards. An application for student teaching in the Department of Home Economics Education must be filed before the junior year. The coordinator of student teaching must be informed of any change in plans.

Recommendation for Teacher Certification. The grade of C on all required home economics courses is a minimum requirement for students seeking a provisional certificate for vocational homemaking education with an average of 2.25 in English and an overall grade-point average of 2.25. Students seeking the provisional certificate for vocational homemaking must apply for the certificate in the Department of Home Economics Education after the completion of student teaching.

Special Endorsements. Special endorsements may be obtained to teach in elementary schools by taking 18 hours of specified elementary education courses if a home economics education major has received a vocational homemaking education provisional certificate. Those who are certified in vocational homemaking education may also obtain endorsements in kindergarten, and early childhood education for the handicapped. Each of these areas requires approximately 12 semester hours as designated by the person in charge of the certification in the College of Education.

Double Major. A major in home economics education can be combined with one or more specializations in each of the other departments in home economics. For the specific course requirements for a double major with home economics education, see the curricula of the various departments of the College of Home Economics.

Second Teaching Field. A home economics education major obtaining a certificate in vocational home economics education may become eligible to teach additional secondary subjects by taking approximately 24 semester hours in specified courses in each subject matter area plus 6 additional hours of secondary education. For specific requirements, consult the chairperson of the subject matter areas.

Minors. A minor in mass communications can be obtained by taking 18 semester hours in approved courses. This minor can provide either a comprehensive background in mass communications or a specialized area including advertising, journalism, photography, public relations, or telecommunications. These areas can assist majors in developing creative careers when combined with their comprehensive backgrounds in home economics. A minor in business administration can be obtained by taking 18 semester hours in approved courses. This minor can help prepare majors for careers that combine a comprehensive home economics background with business principles.

Home Economics Education Curriculum.

Home Economics Education Vocational Home Economics Certification		Vocational Home Economics Certification with Elementary, Kindergarten, and Early Childhood Education for the Handicapped Endorsements	
Basic Curriculum	**Requirements for Certificate**	**Basic Curriculum**	**Requirements for Certificate**
		Approximately 12 hours as designated by the kindergarten certification officer or 12 hours in early childhood education for the handicapped as designated by the certification officer.	
	FIRST YEAR		
ENGL 1301, 1302 H E 1101 Phys., Biol. Sci., Math., or For. Lang. — 3 hrs. Math. or For. Lang. — 3 hrs. P.E., Band, or ROTC — 2 sem.	C D 2303 C&T 1330 or 2301 F&N 2310 FMHC 1370 C&T 2303 Fine Arts elec.	H E 1101 Phys., Biol. Sci., Math., or For. Lang. — 3 hrs. Math. or For. Lang. — 3 hrs. P.E., Band, or ROTC — 2 sem.	ENGL 1301, 1302 C D 2303 C&T 1330 or 2301 F&N 2310 FMHC 1370 C&T 2303 Fine Arts elec.
	SECOND YEAR		
ENGL 2301, 2302 or 2309 HIST 2300, 2301 POLS 2301, 2302 Phys., Biol. Sci., Math., or For. Lang. — 3 hrs. SOC 2301 or 2320 ZOOL 2403	Elec. (upper level) — 6 hrs. SOC 2301 or 2320	ENGL 2301, 2302 or 2309 HIST 2300, 2301 POLS 2301, 2302 Phys., Biol. Sci., Math., or For. Lang. — 3 hrs. ZOOL 2403	Child Dev. elec. — 3 hrs.
	THIRD YEAR		
	Fam. Rel. elec. (upper level) — 3 hrs. FMHC 3380 F&N 3340 C&T 3302 or 4307 EPSY 3330 EDCI 4323 or EDSE 3321 HEED 3301, 4302 FMHC 3370 or 4375 Guided elec. — 2 hrs. Elec. (outside ed. and home ec.) — 3 hrs.	Elementary, Kindergarten, or Early Childhood Ed. for the Handicapped elec. — 3-6 hrs.	Fam. Rel. elec. (upper level) — 3 hrs. FMHC 3380 FMHC 3370 or 4375 F&N 3340 C&T 3302 EPSY 3330 EDCI 4323 or EDSE 3321 HEED 3301, 4302 Guided elec. — 2 hrs.
	FOURTH YEAR		
	FMHC 3381 or 4380 FMHC 4376 Food & Nutr. elec. (upper level) HEED 4102, 4601 F R 3320 Guided elec. — 6 hrs. Child Dev. (upper level) elec. — 3 hrs.	Elementary, Kindergarten, or Early Childhood Ed. for the Handicapped elec. — 6-9 hrs.	FMHC 3381 or 4380 FMHC 4370 Food & Nutr. elec. (upper level) HEED 4102, 4601 F R 3320 Guided elec. — 6 hrs.
TOTAL	**127 hrs.**		**133 hrs.**

Courses in Home Economics Education. (HEED)

2101. Leadership Skills Development (1:1:0). Emphasis on developing leadership skills for participation in the educational environment including student/professional organizations. Includes motivational techniques, group dynamics, conducting meetings, and leading discussions.

3301. Principles of Vocational Home Economics Education (3:3:0). Prerequisite or parallel: EPSY 3330. For majors. Analysis and evaluation of vocational homemaking programs in various school communities; emphasis on principles of learning, instructional objectives, key concepts, and appropriate resources in developing plans for homemaking education including occupational programs.

Home Economics Education Curriculum.

Vocational Home Economics Certification with a Second Teaching Field Outside of Home Economics

Basic Curriculum	Requirements for Certificate	Basic Curriculum	Requirements for Major
Approximately 24 hours as designated by the chairperson of the subject matter department and 6 additional hours of secondary education as designated by the certification officer.			
FIRST YEAR		**THIRD YEAR**	
ENGL 1301, 1302 Phys., Biol. Sci., Math., or For. Lang. — 3 hrs. Math. or For. Lang. — 3 hrs. P.E., Band, or ROTC — 2 sem.	H E 1101 C D 2303 C&T 1330 or 2301 F&N 2310 FMHC 1370 C&T 2303 Fine Arts elec. Elective — 3 hrs.	Elec. (sec. ed.) — 6 hrs. Elec. (2nd tchg. field)	Child Dev. elec. — 3 hrs. Fam. Rel. elec. — 3 hrs. FMHC 3370 or 4375 F&N 3340 C&T 3302 EPSY 3330 EDCI 4323 or EDSE 3321 HEED 3301, 4302 Guided elec. — 2 hrs.
SECOND YEAR		**FOURTH YEAR**	
ENGL 2301, 2302 or 2309 HIST 2300, 2301 POLS 2301, 2302 Phys., Biol. Sci., Math., or For. Lang. — 3 hrs. SOC 2301 or 2320 ZOOL 2403 Elec. (2nd tchg. field) — 6 hrs.	FMHC 3380	Elec. (2nd tchg. field) — 12 hrs.	FMHC 3381 or 4380 FMHC 4376 Food & Nutr. elec. (upper level) HEED 4102, 4601 F R 3320 Guided elec. — 3 hrs.
TOTAL			**148 hrs.**

3303. Educational Processes in Home Economics Professions (3:3:0). Prerequisite: Junior or senior standing. Designed for home economics students with majors other than home economics education. Psychological, sociological, physiological, and economical environments are emphasized in the teaching-learning process.

4102. Home Economics Seminar (1:1:0). Prerequisite: Junior or senior standing. Emphasis upon professional aspects of employment, relation of the total curriculum to professional use, current problems in home economics, and continued growth of the home economist.

4103. Seminar in Home Economics Education Student Teaching (1:1:0). Students participate in vocational home economics programs in secondary schools. Effective teaching, managerial, and disciplinary strategies for secondary school programs are developed.

4206. Problems in Student Teaching (2:2:0). Parallel: HEED 4302. Study of the characteristics, problems, and needs of persons of various socioeconomic, ethnic, and age groups; prestudent teaching field experiences with various groups.

4302. Methods of Teaching Home Economics (3:3:0). Prerequisite: HEED 3301, EPSY 3330; prerequisite or parallel: EDSE 3321 or EDCI 4323. Development of curriculum for providing relevant learning in secondary homemaking education and occupational programs; selection, use, and evaluation of teaching-learning; analysis and evaluation of teaching techniques and procedures used in vocational home economics programs.

4304. Current Issues and Developments in Home Economics Education (3:3:0). Field and classroom experiences in program and curriculum development for adult and secondary levels in home economics education. Teaching competencies are individualized for learners.

4306. Home, School, and Community Experiences in Home Economics Education (3:3:0). Emphasis on occupational home economics and its contributions to the home, school, and community.

4601. Student Teaching in Home Economics (6:6:0). Prerequisite: HEED 4302. Attainment of admission standards to student teaching.

Department of Home and Family Life

Associate Professor Connie Steele, Chairperson.
Professors Fowler, Haley, and Riley; Associate Professors Andersen, Bell, Edwards, Fischer, Joanning, Jorgensen, Keeney, McGhee, and Pinder; Assistant Professors Davidson, Jenkins, Koch, Law, Quinn, Scott, Sollie, Sorell, and Wagner.

This department supervises the following degree programs: HOME AND FAMILY LIFE, *Bachelor of Science in Home Economics* and *Master of Science in Home Economics; Doctor of Philosophy* in HOME ECONOMICS with an option in Home and Family Life.

The Department of Home and Family Life offers a wide range of study in the areas of child and human development, interpersonal relations, and family studies. Graduates of the department may enter a variety of human services vocations and/or pursue graduate studies. In addition, they receive valuable practical training to improve their own competence in parenting, child care, interpersonal relationships, and family living. Students interested only in selected aspects may elect to minor in the department or choose electives while pursuing another major course of study.

Home and Family Life Specializations

A. Child Development

The child development specialization provides study of human development and behavior from the prenatal period through adulthood with emphasis on the early years. Opportunity is afforded in the Child Development Center for the student to observe and interact with infants, toddlers, and young children. Supervised experiences with community groups provide opportunities for interaction with older children and adolescents. These experiences assist students in understanding developmental stages of human behavior and interpersonal relations as they occur in family or group care settings. Senior level courses are focused on professional preparation in several career areas such as child development specialist with extension or other human services agencies, day care teaching and administration, and social work. Students who wish to continue their education into graduate school receive a broadly based study of human behavior and development.

B. Teachers of Young Children

Certification for teachers of young children 3 to 8 is offered with specialization in child development and professional development from early childhood education. For specific requirements for teacher certification, consult the section on Teacher Education in this catalog. Special endorsements may be obtained for special education and early childhood education for exceptional children.

For elementary education majors, home economics may be an area of specialization. For the 24-hour specialization program, required courses are C D 2303, 3306, 3314, 4304, F R 3320, F&N 3350, and FMHC 2370.

C. Family Relations

Drawing on family research and theory, as well as other behavioral sciences, the family relations specialization is the study of the interactions among individual, group, and societal forces as they affect our personal and social well-being within the context of couple, marriage, family, and peer relationships. Developing meth-

Home and Family Life Curriculum.

Child Development		Teachers of Young Children 3 to 8		Family Relations	
Basic Curriculum	**Requirements for Specialization**	**Basic Curriculum**	**Requirements for Certificate**	**Basic Curriculum**	**Requirements for Specialization**
		FIRST YEAR			
ENGL 1301, 1302 SOC 2301 or 2320 Science — 6 hrs. P.E., Band, or ROTC — 2 sem. MCOM 1300	H E 1101 C&T 1330 FMHC 1370 F&N 1310 C D 2190, 2303	ENGL 1301, 1302 SOC 1301 or 1320 Sci., Math., or For. Lang. — 6 hrs. SCOM 1301 or 1303 or 2309 or MCOM 1300 P.E., Band, or ROTC —2 sem.	H E 1101 C&T 1330 FMHC 1370 C D 2190 ECEL 2190 Soc. Sci. elec. — 3 hrs.	ENGL 1301, 1302 SOC 1301 or 1320 PSY 1300 P.E., Band, or ROTC — 2 sem.	H E 1101 C&T 1330 FMHC 1370 F&N 1310 C D 2190, 2303 F R 2320
		SECOND YEAR			
ENGL 2301, 2302 POLS 2301, 2302 HIST 2300, 2301 Science — 6 hrs. ZOOL 2403 or BIOL 1402	C D 2312	English — 6 hrs. POLS 2301, 2302 HIST 2300, 2301 Sci., Math., or For. Lang. — 3 hrs. ZOOL 2403 or BIOL 1402	Fine Arts, Clas., or Phil. — 3 hrs. ECEL 2317 P E 2303	ENGL 2301 POLS 2301, 2302 HIST 2300, 2301 Math. elec. — 3 hrs. ZOOL 2403 or BIOL 1402 Human. elec. — 3 hrs. ECO 2305	Fam. Rel. elec. — 3 hrs.
		THIRD YEAR			
	ART 3361 or 3372 or 3377 or M ED 3336 C D 3302, 3306, 3310, 3312, 3314 F R 3320 F R 3321 or 3324 or 3326 or 3330 or 3332 or 3336 F&N 3350 Elec. — 6 hrs.		ART 3377 M ED 3336 EDSP 3300 EDCI 3333 C D 3306, 3310, 3312, 3314, 4310 F R 3320 F&N 3350	SCOM 3308 Sci. or Math. — 3 hrs. FIN 2320 or ACCT 2303 or MGT 3370 or 3376 Computer Sci. — 3 hrs.	Child Dev. elec. — 6 hrs. F R 3320 Fam. Mgt. elec. — 3 hrs. HEED 3303 Fam. Rel. elec. — 3 hrs. Minor or collateral — 3 hrs.
		FOURTH YEAR			
	C D 3316, 4304, 4312, 4406 C D 4314 or 4319 or 4390 Fam. Mgt. elec. — 3 hrs. HEED 3303, 4102 ECEL 4350 Elec. — 3 hrs. Computer Sci. — 3 hrs.		ECEL 3310, 3350, 3360, 4310, 4350, 4370, 4375, 4390, 4391, EDCI 3340 HEED 4102		F R 4330, 4331, 4332 H&FL 4320 or F R 4332 Fam. Rel. elec. — 9 hrs. HEED 4102 Minor or collateral — 12 hrs.
TOTAL	**130 hrs.**		**130 hrs.**		**129 hrs.**

ods of enriching personal and family living are important concerns of this family relations area.

A variety of courses offer perspectives on interpersonal, marital and family behavior through development of the young child, courtship, early marriage, parenthood, and the middle and later years. Courses at the upper-division level provide professional training for the person wishing to seek employment in family life education, family-oriented social work, extension, probation, and other human service specialties. Those students preparing for graduate work find the family relations specialization a flexible, diverse, and humanistic base from which to continue the study of human development and the family.

Students minoring in family relations take F R 2320, 2322, 3320, and 9 hours of electives in family relations.

Courses in Home and Family Life. (H&FL)

4320. Research in Human Development and Family Studies (3:3:0). Prerequisite: Consent of instructor. Supervised independent work in selected areas. May be repeated once for credit.

Courses in Child Development. (C D)

2190. Observing and Recording Human Behavior (1). Directed instruction in observing specific behaviors.

2303. Child Growth and Development (3:3:0). Study of how growth and development of children can be enhanced within relationships with family, peers, and others. Observation required.

2312. Child Services in the Community (3:3:0). Survey of specific community programs providing care for children and youth.

3300. Development in Early Childhood (3:2:2). Study of the young child as a person and of the influence of environment in the early years as the child grows and develops within himself, the family, and the community. Observation and participation in various preschool situations. Designed for elementary education majors.

3302. Prenatal Development and Infancy (3:3:0). Preparation for parenthood, focusing on prenatal development, birth, infant behavior and development in the early months.

3306. Child Guidance (3:2:2). Prerequisite: C D 2190 or ECEL 2190 or concurrent. Foundations for the development of strategies for promoting self discipline, creative capacities, and positive interpersonal relationships. Emphasis in guiding the total development of the child.

3310. Infant Development (3:2:2). Prerequisite: C D 2190, 3306. Enhancing the psychomotor, social-emotional, and cognitive-language development of infants in their interactions with caregivers, peers, and the environment.

3312. Development of the Young Child (3:2:2). Prerequisite: C D 2190, 3306. Enhancing the psychomotor, social-emotional, and cognitive-language development of young children in their interactions with peers, caregivers, and the environment.

3314. Development in Later Childhood (3:2:2). Prerequisite or concurrent: C D 2190. Enhancing the psychomotor, social-emotional, and cognitive-language development of children in later years in their interactions with peers, adults, and the environment.

3316. Development in Adolescence (3:3:0). Enhancing the psychosocial, social-emotional, and cognitive-moral development of adolescents within their interactions with peers, adults, and the culture.

4304. Parent Involvement (3:3:0). Prerequisite: Senior standing. Strategies for inclusion of parents in the developmental-educational processes of the child. Participation in parent groups and conferences; visitation in home, school, and community settings.

4310. Day Care Systems (3:3:0). Prerequisite: For majors or with consent of instructor. Survey of principles and procedures for managing and implementing various types of day care programs.

4312. Assessment of Child Competence (3:3:0). Prerequisite: C D 3310, 3312, 3314, or consent of instructor.

4314. Practicum in Child Development (3). Prerequisite: Senior standing and 9 hours of child development. Supervised experiences in established career-related positions; focus selected on basis of professional interest. May be repeated for credit.

4319. Seminar in Child Development (3:3:0). Synthesis of current approaches to the study of child development with summary of basic and applied research studies. Review of methodologies utilized in working with children (teaching, counseling, parenting, and other institutional or naturalistic environments).

4390. Student Teaching (3). Prerequisite: Senior standing and admission to student teaching; consent of instructor.

4406. Preparing Environments for Children (4:3:3). Prerequisite: For majors or with consent of instructor. Planning for appropriate furnishings, equipment, and programs for children in home, day care, and other environments. Opportunity to plan for and interact with children in various settings.

Courses in Family Relations. (F R)

2320. Basic Interpersonal Skills (3:3:0). The study and application of interpersonal skills as they relate to various age levels and social contexts.

2322. Courtship and Marriage (3:3:0). Designed to consider the role of interpersonal relationships of dating, courtship, and marriage.

2324. Parenting (3:3:0). Basic principles and skills for parent effectiveness. How parents can create a nurturing home environment through their own adult development. Observation required.

3320. The Contemporary Family (3:3:0). Analysis of family interaction patterns with an introduction to family research. A study of family heritage, development, and networks emphasizing the successful family and sociocultural variations of family forms.

3321. Human Sexuality Through Family Life Cycle (3:3:0). Human sexuality from a life cycle perspective, with an emphasis on developmental, familial, and societal factors that influence individual sexuality.

3322. The Family in the Community (3:3:0). Study of community resources as they relate to welfare of children and families.

3324. Dynamics of Family Interaction (3:3:0). Prerequisite: 6 hours of behavioral/social science. Examination of interpersonal processes in the family and other intimate groups. Conceptual analysis of family interaction patterns — e.g., communication, roles, relationships, power, decision-making, love, conflict.

3326. Families in Crisis (3:3:0). Prerequisite: Sophomore standing. Examination of theories and strategies for helping families deal productively with crises. Consideration of child exceptionality, child abuse, unemployment, divorce, rape, alcoholism, death, and other crisis events.

3328. Family Life Enrichment (3:3:0). Prerequisite: F R 3320 or consent of instructor. Contemporary models and methods for strengthening interpersonal and family relationships. Emphasis on family life education and family enrichment.

3330. Early Years of Marriage (3:3:0). Considerations of the problems of adjustment, interaction, establishment, and growth of the beginning family.

3332. Family Life in the Middle and Later Years (3:3:0). Prerequisite: Junior standing. Needs that arise from changes in family relationships, living arrangements, income, and employment.

3336. Development in Adulthood (3:3:0). Examination of how socialization and personality development affect the individual within the family and social systems throughout the adult years.

4330. Research Methods in Human Development and Family Studies (3:3:0). Prerequisite: F R 3320 or consent of instructor. In-depth study of selected family topics focused on professional preparation. An introduction to process and method in family theory and research.

4331. Seminar in Family Services (3). Prerequisite: F R 3320 and consent of instructor. A problem-centered approach to the family in the community. May be repeated once for credit.

4332. Practicum in Family Services (3). Prerequisite: Consent of instructor. Supervised experiences designed to introduce the student to family service agency operations and to enhance the student's skills in developing helping relationships. May be repeated once for credit.

Health Sciences Center

School of Allied Health

Professor Robert A. Cornesky, *Dean*
Professors McManigal, Merrifield, Miller, and Peake; Associate Professors James, Koch, and Littell; Assistant Professors Clopton, Dulcy, Flagle, Fowler, and Van Slyke.

The Health Sciences Center School of Allied Health offers the following degrees: MEDICAL TECHNOLOGY, *Bachelor of Science*; OCCUPATIONAL THERAPY, *Bachelor of Science*; PHYSICAL THERAPY, *Bachelor of Science*.

The School of Allied Health is unique among health science center allied health schools in Texas because it admits students at two levels: beginning freshmen who, upon completing preprofessional courses at the prescribed minimum levels, are guaranteed placement in the professional program, and third-year (junior level) transfer students who have completed required preprofessional courses at an accredited two- or four-year college or university.

Admission to School of Allied Health programs is by application to the school and is competitive. Admission times and application deadlines vary for the programs and also depend on the level of admission. Inquiries and requests for applications should be directed to

Assistant Dean of Academic Affairs
School of Allied Health
Texas Tech University Health Sciences Center
Lubbock, Texas 79430
(806) 743-3220

Prospective students and other interested persons are encouraged to contact the office of the Assistant Dean of Academic Affairs for information on health careers and educational programs.

School of Nursing

Professor Teddy L. Langford, *Dean*

The School of Nursing, along with the School of Medicine and the School of Allied Health, is located in the Texas Tech University Health Sciences Center — a separate legal institution from Texas Tech University. The School of Nursing offers a four-year *Bachelor of Science in Nursing* degree. The degree program at the Health Sciences Center differs from most other nursing programs in the country because there are *no prerequisite* college courses, and students are involved in direct clinical practice during their first semester of enrollment.

The School of Nursing serves multiple publics by admitting students with no previous nursing background directly into the nursing program as well as licensed vocational nurses (LVNs) and registered nurses (RNs). The latter two groups receive transfer credit or advanced placement so that they complete the program in less than four years. Students who have enrolled in a prenursing program may also apply for admission, although the completion time is not necessarily shortened by having prior college work.

At each entry level the student is usually enrolled at both the Health Sciences Center and Texas Tech University, spending time concurrently in nursing and nonnursing courses. The nonnursing courses are designed to complement the nursing courses, thus strengthening the application of nonnursing content directly to nursing practice. The early opportunity granted for practicing the nursing profession is a key feature of the program. The School of Nursing recognizes previous learning in nursing in determining the placement of students in classes.

Applicants may seek admission to the School of Nursing through one of the three applicant groups which reflect the three entry points in the school's curriculum. Those three groups are described below:

Entering Freshmen. This group includes those entering directly from high school as well as those with no previous nursing education background or with college credit in nonnursing courses.

Licensed Vocational Nurses. This group comprises graduates of state-approved practical or vocational nurse programs who hold a current license to practice vocational nursing in Texas.

Registered Nurses. Licensure to practice as a registered nurse and graduation from a program accredited by the National League for Nursing are the requirements for consideration in this applicant pool.

Although the general qualities of students considered in determining admission are the same for each entry point (each applicant pool), the information that applicants can provide to each of those points varies. Therefore, the materials required for admission consideration vary. The general qualities that are considered in selecting students at each entry point are (1) academic performance and aptitude, (2) ability to perform capably in positions of responsibility for self and others, (3) experience with individuals of cultures other than their own, and (4) career commitment to nursing.

Applicants to the B.S.N. program should identify the entry point to which they seek admission and should then determine their basic eligibility for consideration at that level. Prospective applicants may secure application materials or additional information by contacting

Student Services Coordinator
School of Nursing
Texas Tech University Health Sciences Center
Lubbock, Texas 79430
(806) 743-2737

Minimum Admission Standards.

Entering Freshmen

(1) Graduation from an accredited high school.

(2) Presentation of the following units of high school credit:

English	3
Mathematics (algebra, geometry, trigonometry)	2
Social science	2
Lab. science	1
Electives	7

(3) Acceptable scores on either the SAT or ACT exam.
(4) Cumulative grade-point average of 2.00 or higher.

Licensed Vocational Nurses

(1) High school graduation or G.E.D. equivalent. (If G.E.D. is less than five years old, applicants are required to take Texas Tech University's Mature Student Exam.)
(2) Graduation from a state-approved program in vocational or practical nursing. As of 1986, this requirement will read "graduation from a National League for Nursing accredited program of vocational or practical nursing."
(3) Class standing in the nursing program, year of graduation, at or above the 70th percentile and a cumulative grade-point average of 2.00 or higher.
(4) Current licensure to practice as a licensed vocational nurse.

Registered Nurses

(1) Graduation from a National League for Nursing accredited school of nursing.
(2) Class standing upon graduation at the 50th percentile or above or a cumulative grade-point average of 2.00 on 30 or more semester hours of credit at an accredited college or university.
(3) Current licensure to practice as a registered nurse.

Students are admitted every fall semester. Requests for applications and other information may be picked up in Room C-103, Thompson Hall. The deadline for applying for the fall semester is March 15 of the same year.

Students who have not decided on a school of nursing should contact the Texas Tech University Health Sciences Center School of Nursing Office for information on nursing opportunities and educational programs. Students who are interested specifically in other schools of nursing that require prerequisite nonnursing courses can enroll at Texas Tech University. Most schools will accept as transfer credits those credits earned at the University. A counselor is available in the College of Home Economics to assist students in selecting courses. Students who are interested in a health career but who are unsure of which one to select are encouraged to contact representatives in each of the Health Sciences Center schools.

Directory
1983-1984

(Date following rank indicates year of initial appointment to Texas Tech)

Board of Regents

Officers

B. J. PEVEHOUSE, *Chairman*
ANNE W. SOWELL, *Vice Chairman*
FREDA PIERCE, *Secretary*

Members

Term Expires January 31, 1985

B. J. PEVEHOUSE ..... *Midland*
J. FRED BUCY ..... *Dallas*
NATHAN C. GALLOWAY, M.D. ..... *Odessa*

Term Expires January 31, 1987

JOHN E. BIRDWELL ..... *Lubbock*
REX P. FULLER ..... *Lubbock*
ANNE W. SOWELL ..... *Dallas*

Term Expires January 31, 1989

JERRY FORD ..... *Dallas*
LARRY D. JOHNSON ..... *Houston*
WESLEY W. MASTERS ..... *Amarillo*

Principal Administrative Officers

PRESIDENT LAURO F. CAVAZOS, *Professor of Biological Sciences,* 1980.
B.A., Texas Tech, 1949; M.A., 1951; Ph.D., Iowa State, 1954.

VICE PRESIDENT FOR ACADEMIC AFFAIRS JOHN R. DARLING, *Professor of Business Administration,* 1981.
B.S., Alabama, 1959; M.S., 1960; Ph.D., Illinois, 1967.

VICE PRESIDENT FOR DEVELOPMENT JOHN ROSS BRADFORD, *Professor of Chemical Engineering,* 1943.
B.S. in Ch.E., Texas Tech, 1942; M.S. in Ch.E., 1948; Ph.D., Case Inst. of Technology, 1953.

VICE PRESIDENT FOR FINANCE AND ADMINISTRATION EUGENE E. PAYNE, *Adjunct Associate Professor of Business Administration*, 1981.
B.S., Texas A&M, 1964; M.S., 1965; Ph.D., Oklahoma, 1970.
VICE PRESIDENT FOR RESEARCH AND GRADUATE STUDIES J. KNOX JONES, JR., *Professor of Biological Sciences and Dean, Graduate School*, 1971.
B.A., Nebraska, 1951; M.A., Kansas, 1953; Ph.D., 1962.
VICE PRESIDENT FOR STUDENT AFFAIRS ROBERT H. EWALT, *Associate Professor of Education*, 1973.
B.S., Oregon State, 1956; M.A., Illinois, 1961; Ph.D., 1967.

Horn Professorships

Appointed 1968

HENRY J. SHINE, *Chemistry*
WILLARD F. WILLIAMS, *Agricultural Economics*

Appointed 1970

RICHARD A. DUDEK, *Industrial Engineering*

Appointed 1971

WARREN S. WALKER, *English*

Appointed 1972

HAROLD E. DREGNE, *Agronomy*

Appointed 1975

PILL-SOON SONG, *Chemistry*

Appointed 1977

MAGNE KRISTIANSEN, *Electrical Engineering*

Appointed 1978

M. M. AYOUB, *Industrial Engineering*
HENRY A. WRIGHT, *Range and Wildlife Management*

Appointed 1979

ROBERT J. BAKER, *Biological Sciences*

Appointed 1981

ERIC G. BOLEN, *Range and Wildlife Management*
WILLIAM J. CONOVER, *Business Administration*
MARION O. HAGLER, *Electrical Engineering*

Appointed 1983

DAVID LEON HIGDON, *English*
SHELBY D. HUNT, *Business Administration*

Teaching Faculty

JOHN R. ABERNATHY, *Adjunct Professor of Plant and Soil Science,* 1978.
B.S., Oklahoma State, 1967; M.S., 1969; Ph.D., Illinois, 1972.

JOE ALFRED ADAMCIK, *Associate Professor of Chemistry,* 1957.
B.S., Texas (Austin), 1951; M.A., 1954; Ph.D., Illinois (Urbana), 1958.

VIJENDRA K. AGARWAL, *Assistant Professor of Physics,* 1981.
B.S., Meerut (India), 1966; M.S., 1968; Ph.D., Roorkee (India), 1972.

CHARLES LEONARD AINSWORTH, *Professor of Education and Associate Vice President for Academic Affairs,* 1967.
B.A., Texas Tech, 1953; M.Ed., 1958; Ed.D., 1963.

ROBERT CUSTER ALBIN, *Professor of Animal Science and Associate Dean, College of Agricultural Sciences,* 1964.
B.S., Texas Tech, 1961; M.S., 1962; Ph.D., Nebraska, 1965.

EUGENE RAYMOND ALESCH, *Associate Professor of Art,* 1969.
B.F.A., New Mexico, 1953; M.A., 1954; Ph.D., Ohio, 1968.

BEATRICE WITTE ALEXANDER, *Associate Professor of Romance Languages,* 1945.
B.A., Texas Woman's, 1942; M.A., Texas (Austin), 1946.

THEODOR WALTER ALEXANDER, *Professor of German,* 1947.
B.S., Texas Tech, 1946; M.S., 1947.

ARCHIE CORNELIOUS ALLEN, *Associate Professor of Biological Sciences,* 1963.
B.A., North Carolina (Chapel Hill), 1955; M.A., 1958; Ph.D., Pittsburgh, 1961.

BONNIE L. ALLEN, *Professor of Soils,* 1959.
B.S., Texas Tech, 1948; M.S., Michigan State, 1951; Ph.D., 1960.

NANCY G. ALLEN, *Instructor in English,* 1981.
B.S., Texas (El Paso), 1968; M.S., Texas Tech, 1979.

ROBERT DANIEL AMASON, *Professor of Business Administration,* 1963.
B.B.A., Texas A&M, 1951; M.B.A., 1958; Ph.D., Arkansas, 1963.

ALI REZA AMIR-MOEZ, *Professor of Mathematics,* 1965.
B.A., Teheran (Iran), 1942; M.A., California (Los Angeles), 1951; Ph.D., 1955.

CARL MADSINIUS ANDERSEN, *Associate Professor of Home and Family Life,* 1965.
B.A., McMurry, 1957; Th.M., Perkins School of Theology, Southern Methodist, 1960; M.Ed., Texas Tech, 1970; Ph.D., Florida State, 1974.

JOHN ARTHUR ANDERSON, *Professor of Chemistry,* 1961.
B.S., Colorado State, 1952; M.S., 1954; Ph.D., Oregon State, 1962.

LANE KENT ANDERSON, *Professor of Business Administration,* 1978.
B.S., Brigham Young, 1965; M. Accy., 1966; M.B.A., Wisconsin (Madison), 1970; Ph.D., 1970; CPA, CMA.

ROBERT P. ANDERSON, *Professor of Psychology,* 1955.
M.A., Chicago, 1951; Ph.D., 1954; Lic. Psychol. (Texas)

RONALD MYLES ANDERSON, *Associate Professor of Mathematics,* 1965.
B.A., Luther Coll., 1957; M.S., Iowa State, 1959; Ph.D., 1962.

NORWOOD H. ANDREWS, JR., *Professor of Romance Languages,* 1970.
B.A., Oberlin, 1957; M.A., Oregon, 1959; Ph.D., Wisconsin (Madison), 1964.

MICHAEL ANGELOTTI, *Professor of Education,* 1976.
B.A., Florida State, 1961; M.S., 1967; Ph.D., 1972.

JOSEPH LESLIE ARANHA, *Instructor in Architecture,* 1981.
B.Arch., Indian Inst. of Technology, 1978; M.Arch., Iowa State, 1981.

JAMES ELSON ARCHER, *Professor of Systems and Computer Science,* 1968.
B.S., Texas Tech, 1947; Ph.D., Massachusetts Inst. of Technology, 1950.

THOMAS L. ARCHER, *Adjunct Professor of Entomology,* 1978.
B.S., California State Polytechnic, 1966; Ph.D., California (Riverside), 1971.

DANIEL WAYNE ARMSTRONG, *Associate Professor of Chemistry,* 1983.
B.S., Washington & Lee, 1972; M.S., Texas A&M, 1974; Ph.D., 1977.

SUE ARNOLD, *Assistant Professor of Music,* 1971.
B.A., Campbell Coll., 1969; M.M., Illinois, 1971.

JOYCE A. DAVIS ARTERBURN, *Instructor in Health, Physical Education, and Recreation,* 1959.
B.S. in Ed., Texas Tech, 1954; M.Ed., 1966.

LANE ARTHUR, *Part-time Instructor in Mass Communications,* 1980.
B.A., Texas Tech, 1970; M.A., 1972; J.D., 1976.

*ELLYN V. LUCAS ARWOOD, *Associate Professor of Speech and Hearing Sciences,* 1980.
B.A., Oregon, 1971; M.A., Washington State, 1973; Ed.D., Georgia, 1977.

CLIFFORD CHARLES ASHBY, *Professor of Theatre Arts,* 1963.
B.A., Iowa, 1950; M.A., Hawaii, 1953; Ph.D., Stanford, 1963.

DONALD ASHDOWN, *Professor of Entomology,* 1952.
B.S., Utah State, 1942; Ph.D., Cornell, 1948; Reg. Prof. Entomol.

*GARETH J. ASHTON, *Assistant Professor of Mathematics,* 1981.
B.Sc., London School of Economics (England), 1977; Ph.D., Kings Coll. (England), 1981.

BILLY EARL ASKINS, *Professor and Associate Dean, College of Education,* 1967.
B.S., East Texas State, 1953; M.Ed., Midwestern, 1959; Ed.D., North Texas State, 1967.

ELIZABETH CAROLYN ATER, *Associate Professor of Family Management, Housing, and Consumer Science,* 1969.
B.S., Ohio State, 1952; M.S., 1955; Ph.D., 1969.

RALPH HENRY ATKINSON, Assistant Professor of Health, Physical Education, and Recreation, 1975.
B.S. in Ed., Texas Tech, 1960; M.Ed., 1966; Ed.D., North Texas State, 1973.

LARRY M. AUSTIN, *Professor and Associate Dean, College of Business Administration,* 1976.
B.S., Memphis State, 1956; M.S., Texas A&M, 1966; Ph.D., 1971.

EDWARD W. AVERILL, *Associate Professor of Philosophy,* 1980.
A.B., Harvard, 1956; Ph.D., California (Santa Barbara), 1976.

WENDELL MARSHALL AYCOCK, *Associate Professor of English and Comparative Literature,* 1969.
B.A., Texas Tech, 1962; M.A., 1965; Ph.D., South Carolina, 1969.

MOHAMED MOHAMED AYOUB, *Horn Professor of Industrial Engineering and Biomedical Engineering,* 1961.
B.S.M.E., Cairo (Egypt), 1953; M.S.I.E., Iowa, 1955; Ph.D., 1964.

WALTER FRANKLIN BABER III, *Assistant Professor of Political Science,* 1982.
B.A., California State (Long Beach), 1975; M.A., North Carolina, 1975; Ph.D., 1980.

THOMAS I. BACON, *Associate Professor of German,* 1974.
B.A., Texas Tech, 1963; M.A., Texas (Austin), 1967; Ph.D., 1970.

BILL BASIL BAGLEY, *Associate Professor of Art,* 1973.
B.F.A., Phillips, 1962; M.F.A., Kansas, 1965.

DONALD BAILEY, *Professor of Music,* 1983.
B.M.E., Eastern New Mexico, 1965; M.A., 1966; D.A., Northern Colorado, 1976.

LORRAINE BAILLIE, *Assistant Professor of Health, Physical Education, and Recreation,* 1982.
B.A., Illinois, 1977; M.A., 1979; Ph.D., 1982.

ROBERT JAMES BAKER, *Horn Professor of Biological Sciences and Museum Science,* 1967.
B.S., Arkansas A&M, 1963; M.S., Oklahoma State, 1965; Ph.D., Arizona, 1967.

THOMAS E. BAKER, *Associate Professor of Law,* 1979.
B.S., Florida State, 1974; J.D., Florida, 1977; Member State Bar (Florida).

FRANCISCO ENRIQUE BALDERRAMA, *Assistant Professor of History,* 1981.
B.A., Loyola (Los Angeles), 1970; M.A., California (Los Angeles), 1972; Ph.D., 1978.

GEORGE LEWIS BALDWIN, *Associate Professor of Mathematics,* 1966.
B.S., Eastern New Mexico, 1948; M.A., 1952; Ph.D., Oklahoma, 1961.

JACK NORMAN BALDWIN, JR., *Assistant Professor of Political Science,* 1981.
A.B., Georgia, 1974; M.P.A., Georgia State, 1975; Ph.D., Georgia, 1981.

RAJARAM BALIGA, *Assistant Professor of Business Administration,* 1980.
B.E., Madras (India), 1971; M.B.A., Indian Inst. of Management, 1973; D.B.A., Kent State, 1980.

LAURA BALLEW, *Instructor in Romance Languages,* 1964.
B.A., Texas Tech, 1964; M.A., 1969.

GAIL BARBER, *Associate Professor of Music,* 1966.
B.M., Eastman School of Music, 1959.

JAMES JOSEPH BARBER, *Professor of Music,* 1966.
B.M., Eastman School of Music, 1958; M.M., 1959; D.M.A., 1964.

THOMAS T. BARKER, *Assistant Professor of English,* 1982.
B.A., Texas (Austin), 1971; M.A., 1973; Ph.D., 1980.

ROGER W. BARNARD, *Associate Professor of Mathematics,* 1973.
B.S., Kent State, 1965; M.S., 1968; Ph.D., Maryland, 1971.

CALVIN GLENN BARNES, *Assistant Professor of Geosciences,* 1982.
B.S., Nebraska (Lincoln), 1975; M.S., Oregon, 1978; Ph.D., 1982.

CHESTER ALWYN BARR, *Professor and Chairperson, Department of History,* 1969.
B.A., Texas (Austin), 1959; M.A., 1961; Ph.D., 1966.

JAMES E. BARRICK, *Assistant Professor of Geosciences,* 1980.
B.S., Ohio State, 1973; M.S., Iowa, 1975; Ph.D., 1978.

ROBERT VIRGIL BARTLETT, *Assistant Professor of Political Science,* 1982.
A.B., Indiana, 1974; M.P.A., 1976.

RICHARD FLEMING BARTON, *Professor of Business Administration,* 1967.
B.S., Northwestern, 1948; Ph.D., California (Berkeley), 1961.

RICHARD ALLEN BARTSCH, *Professor and Chairperson, Department of Chemistry,* 1974.
B.A., Oregon State, 1962; M.S., 1963; Ph.D., Brown, 1967.

HAL M. BATEMAN, *Professor of Law,* 1972.
B.A., Rice, 1954; J.D., Southern Methodist, 1956; Member State Bar (Texas and Missouri).

DIANA L. BATES, *Assistant Professor of Special Education,* 1981.
B.A., Wisconsin (Eau Claire), 1971; M.A., Wisconsin (Madison), 1977; Ph.D., 1981.

CLARENCE LEONADAS BAUGH, *Associate Professor of Biological Sciences,* 1971.
B.S., Oklahoma, 1954; M.S., 1956; Ph.D., Iowa State, 1961.

C. W. BAUGH, *Adjunct Assistant Professor Family Management, Housing, and Consumer Science,* 1982.
B.A., Western Kentucky, 1973; M.A., 1975; Ph.D., Texas Tech, 1979.

KEITH BEARDEN, *Assistant Professor of Music,* 1980.
B.M.Ed., Texas Tech, 1969; M.Ed., 1975.

CONSTANCE K. BECK, *Assistant Professor of Biological Sciences,* 1980.
B.S., Texas Tech, 1967; M.S., 1971.

STEVEN R. BECK, *Professor and Chairperson, Department of Chemical Engineering,* 1977.
B.S., Kansas State, 1969; Ph.D., Texas (Austin), 1972; Reg. Prof. Engr. (Texas).

WELDON EARNEST BECKNER, *Professor of Education and Area Coordinator, Administration and Supervision,* 1965.
B.S., Wayland Baptist, 1955; M.Ed., Texas Tech, 1959; Ed.D., Colorado, 1966.

JEAN CAMILLE G. BELL, *Professor and Chairperson, Department of Home Economics Education,* 1963.
B.S., Texas Tech, 1942; M.S., 1949; Ed.D., 1967.

NANCY J. BELL, *Associate Professor of Home and Family Life,* 1974.
B.A., Allegheny Coll., 1963; M.A., Northern Illinois, 1971; Ph.D., Northwestern, 1973.

ROBERT W. BELL, *Professor of Psychology,* 1973.
A.B., Washburn, 1956; M.S., Purdue, 1958; Ph.D., 1959.

DANNY N. BELLENGER, *Professor of Business Administration and Area Coordinator, Marketing,* 1981.
B.S., Alabama, 1968; M.S.C., 1970; Ph.D., 1972.

HAROLD R. BENNETT, *Professor of Mathematics,* 1968.
B.S., Idaho State, 1963; M.A., Arizona State, 1965; Ph.D., 1968.

JAMES WAYLAND BENNETT, *Thompson Professor of Agricultural Finance and Associate Dean, College of Agricultural Sciences,* 1948.
B.S., Texas Tech, 1948; M.S., Louisiana State, 1951; Ph.D., 1955.

WILLIAM FREDERICK BENNETT, *Professor of Plant and Soil Science and Associate Dean, College of Agricultural Sciences,* 1968.
B.S., Oklahoma State, 1950; M.S., Iowa State, 1952; Ph.D., 1958.

GERARD J. BENSBERG, *Professor of Special Education and Adjunct Professor of Psychiatry,* 1971.
B.S., Arkansas Coll., 1948; M.A., Arkansas, 1949; Ph.D., George Peabody Coll. for Teachers, 1957; Cert. & Lic. Psychol. (Texas).

DANIEL H. BENSON, *Professor of Law,* 1973.
B.A., Texas (Austin), 1958; J.D., 1961; M.A., Texas Tech, 1974; Member State Bar (Texas and District of Columbia).

ROBERT KENNETH BENSON, *Visiting Assistant Professor of Mass Communications,* 1983.
B.S., Arkansas State, 1974; M.A., Texas Tech, 1981.

**RUBEN BEREZDIVIN, *Assistant Professor of Philosophy,* 1978.
B.A., Florida, 1968; M.A., 1972; Ph.D., Duquesne, 1976.

JERRY DEAN BERLIN, *Professor of Biological Sciences,* 1968.
B.S., Missouri, 1960; M.A., 1961; Ph.D., Iowa State, 1964.

FRANCIS DAVID BERTRAM, *Lecturer in Business Administration,* 1982.
A.B., Marquette, 1969; M.A., 1971; Ph.D., 1975.

ROBERT MORRISON BETHEA, *Professor of Chemical Engineering,* 1966.
B.Sc., Virginia Polytechnic Inst., 1957; M.S., Iowa State, 1959; Ph.D., 1964; Reg. Prof. Engr. (Texas).

JULIAN LAWSON BIGGERS, JR., *Professor of Education,* 1966.
B.S., East Texas State, 1950; M.Ed., Texas (Austin), 1956; Ph.D., 1966.

SHAN L. BILIMORIA, *Assistant Professor of Biological Sciences,* 1978.
B.Sc., Otago (New Zealand), 1971; Ph.D., 1975.

WILLIAM ROBERT BLACKSTONE, *Lecturer in Mechanical Engineering,* 1983.
B.S. in M.E., Texas A&M, 1960; B.A., 1960.

JOHN D. BLAIR, *Associate Professor of Management,* 1981.
B.A., Gustavus Adolphus, 1966; M.A., Michigan, 1972; Ph.D., 1975.

PATRICIA A. BLAIR, *Captain, U.S.A.F., Assistant Professor of Aerospace Studies,* 1982.
B.S., Mississippi Valley State, 1974; M.S., Mississippi State, 1977.

LOWELL LAWRENCE BLAISDELL, *Professor of History,* 1957.
B.A., Elmhurst, 1941; M.A., Rochester, 1944; Ph.D., Wisconsin, 1949.

BRIAN LAYTON BLAKELEY, *Associate Professor of History,* 1970.
B.S., Wisconsin State, 1962; M.A., Duke, 1964; Ph.D., 1966.

JAY S. BLANCHARD, *Assistant Professor of Education,* 1982.
B.A., Drake, 1968; M.S.T., 1974; Ph.D., Georgia, 1979.

FRANCIS ELDON BLOOMER, *Associate Professor of Education,* 1971.
A.B., Wichita State, 1955; M.Ed., 1961; Ph.D., Ohio State, 1971.

MACKIE BOBO, *Lecturer in Education,* 1981.
B.S., Sam Houston State, 1965; M.A., 1972; Ed.D., Texas Tech, 1979.

MICHAEL BOBO, *Associate Professor of Health, Physical Education, and Recreation,* 1970.
B.S., Sam Houston, 1966; M.A., 1967; Ph.D., Maryland, 1971.

CAROLUS BOEKEMA, *Assistant Professor of Physics,* 1983.
B.S., Groningen, 1972; Ph.D., 1977.

JAMES G. BOGLE, *Associate Professor of Music*, 1976.
B.M., Baylor, 1971; M.M., Midwestern, 1973; Ph.D., Oklahoma, 1982.

ERIC GEORGE BOLEN, *Horn Professor of Wildlife Management and Associate Dean, Graduate School*, 1978.
B.S., Maine, 1959; M.S., Utah State, 1962; Ph.D., 1967.

WALLACE JAMES BORCHARDT, *Assistant Professor of Health, Physical Education, and Recreation*, 1977.
B.Sc., Wisconsin, 1972; M.P.E., British Columbia, 1976.

MARY MIDDLETON BOSWELL, *Associate Professor of Home Economics Education*, 1968.
B.S., North Texas State, 1941; M.S., 1958.

HARRISON NESBIT BOWES, *Instructor in Health, Physical Education, and Recreation*, 1979.
B.S., Texas, 1955.

OSWALD DONIECE BOWLIN, *Professor of Finance*, 1965.
B.A., Texas A&M, 1951; M.S., 1954; Ph.D., Illinois, 1959.

JOHN ROSS BRADFORD, *Professor of Chemical Engineering and Vice President for Development*, 1943.
B.S. in Ch.E., Texas Tech, 1942; M.S. in Ch.E., 1948; Ph.D., Case Inst. of Technology, 1953; Reg. Prof. Engr. (Texas and Ohio).

WILLIAM STEVEN BRADLEY, *Assistant Professor of Museum Science and Curator of Art*, 1983.
B.A., Colorado, 1971; M.A., Northwestern, 1974; Ph.D., 1981.

THOMAS E. BRADY, *Associate Professor of Biological Sciences*, 1974.
B.A., Beloit Coll., 1967; M.S., Yale, 1969; Ph.D., 1972.

DOUGLAS HENRY BRANDON, *Assistant Professor of Engineering Technology*, 1980.
B.S., Texas Tech, 1973; M.S. in E.E., 1978.

ROBERTO BRAVO, *Associate Professor of Romance Languages*, 1971.
Lic. Letras, Nuevo Leon (Mexico), 1964; M.L.S., Texas (Austin), 1969; Ph.D., Complutense (Madrid), 1978.

RALPH R. BRAVOCO, *Associate Professor of Business Administration*, 1982.
B.A., Northeastern, 1966; M.A., 1969; Ph.D., Massachusetts, 1971.

CHARLES WILLIAM BREWER, *Associate Professor of English*, 1972.
B.A., Texas (Austin), 1964; M.A., 1967.

RAYMOND D. BRIGHAM, *Adjunct Professor of Plant and Soil Science*, 1980.
B.S., Texas Tech, 1950; M.S., Iowa State, 1952; Ph.D., 1957.

PEGGY HOWARD BRIGHT, *Associate Professor of Art*, 1966.
B.S., Texas Woman's, 1938; M.A., 1963.

JAMES EASTGATE BRINK, *Associate Professor of History*, 1976.
B.A., Kansas, 1967; M.A., Washington, 1970; Ph.D., 1974.

ANTHONY NORMAN BRITTIN, *Professor of Music*, 1963.
B.M.E., Florida State, 1959; M.M., Manhattan School of Music, 1963.

DOROTHY HELEN CLARK BRITTIN, *Associate Professor of Food and Nutrition*, 1965.
B.S., Florida State, 1960; M.S., Texas Tech, 1965; Ph.D., 1974.

CARLTON M. BRITTON, *Associate Professor of Range Management*, 1980.
B.S., Texas Tech, 1968; M.S., 1970; Ph.D., Texas A&M, 1975.

GEOANNE BROTHERSTON, *Lecturer in Art*, 1979.
B.A., Auburn, 1977; M.F.A., Texas Tech, 1978.

LEONARD JAMES BROWNLEE, JR., *Assistant Professor of Education and Assistant Vice President for Academic Affairs*, 1981.
A.B., Missouri (Columbia), 1959; M.Ed., 1960; Ed.S., 1978; Ph.D., 1979.

FRED C. BRYANT, *Associate Professor of Range Management*, 1977.
B.S., Texas Tech, 1970; M.S., Utah State, 1974; Ph.D., Texas A&M, 1977.

CHARLES P. BUBANY, *Professor of Law*, 1971.
B.A., Saint Ambrose Coll., 1962; J.D., Washington, 1965; Member State Bar (Missouri).

DAVID PAUL BUCHHOLZ, *Assistant Professor of Mass Communications*, 1982.
B.S., Birmingham-Southern, 1977; M.S., Tennessee, 1982.

FRED BUDDINGH, *Adjunct Professor of Animal Science and Professor of Pathology*, 1973.
D.V.M., Colorado State, 1951; Ph.D., California (Davis), 1969.

DONALD L. BUMPASS, *Associate Professor of Economics*, 1981.
B.A., Oklahoma State, 1966; M.S., 1973; Ph.D., 1976.

CHARLES LOUIS BURFORD, *Professor of Industrial Engineering and Computer Science*, 1957.
B.S., Texas Tech, 1954; M.S., Oklahoma State, 1962; Ph.D., 1966; Reg. Prof. Engr. (Oklahoma and Texas).

JOHN J. BURKE, *Adjunct Professor of Plant and Soil Science and Biology*, 1982.
B.S., Arizona State, 1973; M.S., 1975; Ph.D., Illinois, 1979.

JOHN EDWARD BURKHARDT, *Professor of Health, Physical Education, and Recreation*, 1968.
B.A., Simpson Coll., 1961; M.A., Iowa, 1964; Ph.D., 1969.

JOHN HOWARD BURNETT, JR., *Associate Professor of Political Science*, 1966.
A.B., West Virginia Wesleyan, 1958; M.A., Emory, 1960; Ph.D., 1966.

JOHN JAMES BURNETT, *Associate Professor of Business Administration*, 1976.
B.S., Southern Illinois, 1966; M.S., 1968; D.B.A., Kentucky, 1977.

JAMES R. BURNS, *Associate Professor of Management Science*, 1973.
B.S.A.E., Colorado, 1966; M.S.A.E., Purdue, 1967; Ph.D., 1973; Reg. Prof. Engr. (Texas).

JOHN MITCHELL BURNS, *Professor of Biological Sciences*, 1969.
B.S., New Mexico State, 1963; M.S., 1966; Ph.D., Indiana, 1969.

CHRISTINA M. BURTON, *Assistant Professor of Art*, 1983.
B.S., Northern Illinois, 1976; M.F.A., 1983.

DONNA RUTH BUSTAMANTES, *Instructor in English*, 1982.
B.S., Midwestern, 1969; M.A., Texas Tech, 1974.

CHARLES EDWARD BUTLER, *Associate Professor of Economics*, 1971.
B.A., Tennessee, 1957; M.S., 1959; Ph.D., Harvard, 1966.

LESTER G. BUTLER, *Associate Professor of Education and Area Coordinator, Educational Specializations*, 1974.
B.S., Central State Coll. (Oklahoma), 1963; M.A., Ohio State, 1969; Ph.D., 1972.

ROBERT E. BYERLY, *Assistant Professor of Mathematics*, 1980.
S.B., Massachusetts Inst. of Technology, 1973; M.A., State U. of New York (Buffalo), 1975; Ph.D., 1979.

JOHN L. BYRD, *Captain, U.S.A.F., Assistant Professor of Aerospace Studies*, 1981.
B.S.Ed., Midwestern State, 1973; M.S., Arkansas, 1976.

WALTER LEE CALVERT, *Professor of Architecture and Family Management, Housing, and Consumer Science*, 1963.
B.S., Kansas, 1960; M.Arch., 1963; Reg. Arch. (Kansas and Texas).

EARL D. CAMP, *Professor of Biological Sciences*, 1945.
B.S., Texas Tech, 1941; M.S., New Mexico, 1943; Ph.D., Iowa, 1952.

ROBERT GORDON CAMPBELL, *Associate Professor of Anthropology*, 1969.
B.A., Vanderbilt, 1953; M.A., Colorado, 1955; Ph.D., 1969.

ANN CLIFFORD CANDLER, *Associate Professor of Education*, 1976.
B.S., Lamar, 1970; M.Ed., Houston, 1973; Ed.D., 1976.

BILL W. CANTRELL, *Lecturer in Architecture*, 1979.
B.Arch., Texas Tech, 1951; Reg. Arch. (Arizona, Colorado, New Mexico, Oklahoma, Texas).

ROBERT E. CARLILE, *Professor and Chairperson, Department of Petroleum Engineering*, 1983.
B.S., Tulsa, 1958; M.S., 1960; Ph.D., Texas A&M, 1963; Reg. Prof. Engr. (Louisiana).

**RICHARD HOWARD CARLSON, *Associate Professor of Psychology*, 1966.
B.S., Minnesota, 1952; M.Ed., Hawaii, 1953; Ph.D., Minnesota, 1963; Cert. Psychol. (Texas).

HERBERT J. CARPER, JR., *Associate Professor of Mechanical Engineering*, 1978.
B.S., Texas A&M, 1960; M.S., 1962; Ph.D., Arizona State, 1969; Reg. Prof. Engr. (Texas).

RALPH M. CARTER, *Associate Professor of Education*, 1971.
B.A., Colorado, 1951; M.A., Middlebury Coll., 1957; Ph.D., Ohio State, 1972.

WALTER JOSEPH CARTWRIGHT, *Professor of Sociology*, 1962.
B.A., Southern Methodist, 1943; M.Th., 1946; M.A., Texas (Austin), 1960; Ph.D., 1964.

WILLIAM R. CASTO, *Associate Professor of Law,* 1983.
B.S., Tennessee (Knoxville), 1970; J.D., 1973; J.S.D., Columbia, 1983; Member State Bar (Tennessee).

LAURO F. CAVAZOS, *Professor of Biological Sciences and President,* 1980.
B.A., Texas Tech, 1949; M.A., 1951; Ph.D., Iowa State, 1954.

STANLEY EDWARD CEBULL, *Professor of Geosciences,* 1967.
A.B., California (Berkeley), 1957; M.A., 1958; Ph.D., Washington, 1967.

MARVIN JOHN CEPICA, *Associate Professor of Agricultural Education,* 1977.
B.S., Texas Tech, 1966; M.S., 1967; Ed.D., Oklahoma State, 1977.

HUGH PAUL CHALFANT, *Professor and Chairperson, Department of Sociology,* 1974.
B.A., Coll. of Wooster, 1951; M.Div., McCormick Seminary, 1954; M.S., Oklahoma State, 1967; Ph.D., Notre Dame, 1970.

VALERIE M. CHAMBERLAIN, *Professor of Home Economics Education,* 1971.
B.S., Vermont, 1951; M.S., Florida State, 1963; Ph.D., 1969.

JOHN R. CHAMPLIN, *Associate Professor of Education,* 1982.
B.A., Drew, 1949; M.A., Montclair State, 1959; Ed.D., Massachusetts, 1971.

KAMAL C. CHANDA, *Professor of Mathematics and Statistics,* 1973.
B.Sc., Calcutta, 1948; M.Sc., 1950; Ph.D., Manchester, 1958.

CHARLES RAY CHANDLER, *Associate Professor of Sociology,* 1966.
B.A., North Texas State, 1956; Ph.D., Tulane, 1967.

KWONG SHU CHAO, *Professor of Electrical Engineering,* 1968.
B.S. in E.E., Cheng Kung, 1962; M.S., 1964; M.S., Rice, 1967; Ph.D., 1968.

DOUGLAS CHATFIELD, *Associate Professor of Psychology,* 1969.
B.S., Evangel Coll. (Misssouri), 1964; M.A., Nebraska (Omaha), 1968; Ph.D., Ohio State, 1970.

ROBERT EVANS CHATFIELD, *Assistant Professor of Finance,* 1981.
B.A., Eastern Nazarene, 1975; M.S., Purdue, 1977; Ph.D., 1979.

SANKAR CHATTERJEE, *Assistant Professor of Museum Science and Curator of Vertebrate Paleontology,* 1979.
B.S., Jadvapur (Calcutta), 1962; M.S., 1964; Ph.D., Calcutta U., 1970.

BEVERLY JANE CHEATHAM, *Assistant Professor of Art,* 1973.
B.A., Colorado, 1957; M.F.A., Texas Tech, 1980.

FRANK R. CHEATHAM, *Professor of Art,* 1973.
Bach. Prof. Arts, Art Center Coll. of Design (Los Angeles), 1960; B.F.A., M.F.A., Los Angeles County Art Inst., 1969.

WALTER JON CHESNAVICH, *Assistant Professor of Chemistry,* 1980.
B.A., Northeastern, 1968; M.A., California (Santa Barbara), 1970; Ph.D., 1976.

RONALD K. CHESSER, *Assistant Professor of Biological Sciences,* 1981.
B.S., Oklahoma, 1973; M.S., Memphis State, 1976; Ph.D., Oklahoma, 1981.

CARL JOHN CHILDERS, JR., *Professor of Architecture,* 1959.
B.Arch., Texas Tech, 1952; Reg. Arch. (Texas).

JUNE CHIODO, *Assistant Professor of Psychology,* 1983.
B.S., Pittsburgh, 1979; M.S., Georgia, 1981; Ph.D., 1983.

KEY RAY CHONG, *Associate Professor of History,* 1970.
B.A., Aoyama Gakuin (Japan), 1960; M.A., Washington (Seattle), 1964; Ph.D., Claremont Graduate School (California), 1966.

LAWRENCE BERNARD CHONKO, *Associate Professor of Business Administration,* 1978.
B.S., Lehigh, 1973; M.B.A., Houston, 1975; Ph.D., 1978.

A. DUANE CHRISTIAN, *Associate Professor of Education,* 1971.
B.A., McMurry, 1954; M.A., Texas (Austin), 1965; Ph.D., 1971.

PEDER GEORGE CHRISTIANSEN, *Professor of Classical Languages,* 1963.
B.A., Carroll Coll., 1956; M.A., Wisconsin, 1957; Ph.D., 1963.

ALFRED CISMARU, *Professor of Romance Languages,* 1970.
B.A., Fordham, 1956; M.A., New York, 1957; Ph.D., 1960.

B. J. CLABORN, *Associate Professor of Civil Engineering,* 1963.
B.S., Texas Tech, 1956; M.S., Stanford, 1957; Ph.D., Texas (Austin), 1970; Reg. Prof. Engr. (California).

DONALD K. CLANCY, *Associate Professor of Business Administration,* 1982.
B.S., Pennsylvania State, 1970; M.B.A., 1971; Ph.D., 1976.

JAMES RICHARD CLARK, *Assistant Professor of Animal Science,* 1977.
B.S., Missouri, 1968; M.S., 1970; Ph.D., Wisconsin, 1974.

BRUCE C. CLARKE, *Assistant Professor of English,* 1982.
B.A., Columbia, 1974; Ph.D., State U. of New York (Buffalo), 1980.

LUTHER DAVIS CLEMENTS, JR., *Associate Professor of Chemical Engineering,* 1976.
B.S., Oklahoma State, 1966; M.S., Illinois, 1968; Ph.D., Oklahoma, 1973; Reg. Prof. Engr. (Texas).

JAMES R. CLOPTON, *Associate Professor of Psychology,* 1976.
B.A., Kansas, 1968; M.A., 1970; Ph.D., 1974; Lic. Psychol. (Texas).

NANCY ANN CLOPTON, *Assistant Professor of Physical Therapy,* 1983.
B.S., Kansas, 1970; M.S., Texas Woman's, 1983.

JOHN W. COBB, *Professor of Health, Physical Education, and Recreation,* 1958.
B.S., Corpus Christi, 1951; M.Ed., Texas Tech, 1954; P.E.D., Indiana, 1958.

CLARKE COCHRAN, *Professor and Chairperson, Department of Political Science,* 1970.
B.A., Brown, 1967; M.A., Duke, 1969; Ph.D., 1971.

DENNIS CLARK COGAN, *Associate Professor of Psychology,* 1966.
B.S., Wisconsin (Milwaukee), 1959; M.A., Missouri, 1964; Ph.D., 1966.

ROSEMARY COGAN, *Associate Professor of Psychology,* 1966.
B.A., Missouri, 1964; M.A., 1966; Ph.D., 1971.

FRANK COLLINS, *Professor of Accounting,* 1981.
B.B.A., Texas, 1960; M.S., Houston, 1971; Ph.D., 1974; CPA.

JACQUELIN COLLINS, *Associate Professor of History,* 1962.
B.A., Rice, 1956; M.A., 1959; Ph.D., Illinois, 1964.

JOSEPH B. CONBOY, *Lecturer in Law and Associate Dean, School of Law,* 1982.
B.S., Canisius Coll., 1954; J.D., Georgetown U. Law Center, 1956; LL.M., George Washington National Law Center, 1972; Member State Bar (New York).

WILLIAM JAY CONOVER, *Horn Professor of Statistics and Associate Dean, College of Business Administration,* 1973.
B.S., Iowa State, 1958; M.S., Catholic U. of America, 1962; Ph.D., 1964.

WILLIAM B. CONROY, *Professor of Geography and Dean, College of Arts and Sciences,* 1969.
B.A., Notre Dame, 1953; M.A., Syracuse, 1959; Ph.D., 1963.

JOHN ACKLEE COOK, *Assistant Professor of Speech Communication,* 1983.
B.S., Louisiana State, 1974; M.A., 1977; Ph.D., North Texas State, 1982.

MARIANNE COOLEY, *Assistant Professor of English,* 1980.
B.A., Oklahoma State, 1966; M.A., Texas (Austin), 1969; Ph.D., 1972.

MICHAEL K. CORBELL, Major, U.S.A., *Assistant Professor of Military Science,* 1983.
B.S., Texas Tech, 1970; M.A., Pepperdine, 1977.

STEPHEN S. CORBETT, *Assistant Professor of Romance Languages,* 1979.
B.A., Brigham Young, 1973; M.A., 1975; Ph.D., Purdue, 1979.

ROBERT A. CORNESKY, *Professor of Medical Technology and Dean, School of Allied Health,* 1982.
B.S., Geneva, 1956; M.S., George Washington, 1962; Sc.D., Pittsburgh, 1970.

JOE D. CORNETT, *Professor of Education,* 1968.
B.A., Northwestern State, 1960; M.Ed., 1963; Ed.D., Arkansas, 1965.

VIVIAN IVONNE CORREA, *Assistant Professor of Education,* 1982.
B.S., Georgia State, 1974; M.Ed., Georgia, 1975; Ph.D., George Peabody Coll. of Vanderbilt, 1982.

ALBERTO CORTES, *Adjunct Associate Professor of Philosophy,* 1971.
B.S., Stanford, 1955; M.S., California (Berkeley), 1958; M.A., 1961; Ph.D., Indiana, 1971.

CHRISTY LEE COTTON, *Instructor in Health, Physical Education, and Recreation*, 1982.
B.S., Texas Tech, 1980.

ANNA SUE COUCH, *Assistant Professor of Home Economics Education*, 1978.
B.S., Kentucky, 1959; M.S., 1976; Ed.D., 1978.

MURRAY WHITFIELD COULTER, *Associate Professor of Biological Sciences*, 1964.
B.A., Emory, 1954; M.S., Arizona, 1957; Ph.D., California (Los Angeles), 1963.

JAMES F. COURTNEY, *Associate Professor of Business Administration*, 1979.
B.A., Texas, 1966; M.B.A., 1969; Ph.D., 1974.

BILLY FRANK CRADDOCK, *Assistant Professor of Animal Science*, 1981.
B.S., Texas A&M, 1971; M.S., Wyoming, 1973; Ph.D., Texas A&M, 1978.

JOHN PAUL CRAIG, *Professor of Electrical Engineering*, 1957.
B.S. in E.E., Texas Tech, 1950; Ph.D., Texas (Austin), 1965; Reg. Prof. Engr. (Texas).

SYDNEY PAUL CRAVENS, *Associate Professor of Romance Languages*, 1972.
B.A., Sam Houston State, 1962; Ph.D., Kansas, 1972.

DUANE AUSTIN CRAWFORD, *Associate Professor of Petroleum Engineering*, 1958.
B.S., Missouri (Rolla), 1952; M.S., Pennsylvania State, 1959; Reg. Prof. Engr. (Texas).

JOHN RICHARD CRIDER, *Associate Professor of English*, 1966.
B.A., Baylor, 1953; M.A., 1954; Ph.D., Rice, 1960.

ALEX BELCHER CROWDER, JR., *Professor of Education*, 1965.
B.S., Hardin-Simmons, 1950; M.Ed., 1951; Ed.D., North Texas State, 1965.

DOUGLAS E. CROWELL, *Assistant Professor of English*, 1981.
B.A., Rice, 1974; M.A., Johns Hopkins, 1976; Ph.D., State U. of New York, 1981.

RUTH ANN CRUMP, *Visiting Instructor in Speech and Hearing Sciences*, 1983.
B.S., Texas Tech, 1975; M.A., Texas Woman's, 1982.

PAUL L. CRUTCHFIELD, *Instructor in Physical Education*, 1983.
B.G.S., Iowa, 1978.

JAMES WILLIAM CULP, *Professor of English and Associate Dean, College of Arts and Sciences* 1967.
B.A., Abilene Christian, 1949; M.A., Vanderbilt, 1950; Ph.D., 1956.

MERRILYN N. CUMMINGS, *Associate Professor of Home Economics Education*, 1974.
B.S., Connecticut, 1968; M.S., Cornell, 1973; Ph.D., 1975.

PAMELA R. CUMMINGS, *Assistant Professor of Home Economics Education*, 1983.
B.A., Arizona State, 1966; M.Ed., Central State, 1979; Ph.D., Oklahoma State, 1982.

DAVID C. CUMMINS, *Professor of Law*, 1970.
B.S., Idaho, 1957; J.D., Washington, 1960; LL.M., New York, 1969; Member State Bar (Texas, Washington).

DONALD H. CUNNINGHAM, *Professor of English*, 1983.
A.B., Missouri, 1961; M.A., 1962; Ph.D., 1972.

SAMUEL EVERETT CURL, *Professor of Animal Science and Dean, College of Agricultural Sciences*, 1961.
B.S., Sam Houston State, 1959; M.S., Missouri, 1961; Ph.D., Texas A&M, 1963.

EVANS W. CURRY, *Associate Professor of Sociology*, 1976.
B.A., Louisiana Coll., 1965; M.A., Louisiana State, 1970; Ph.D., 1973.

HOWARD J. CURZER, *Visiting Assistant Professor of Philosophy*, 1983.
B.A., Wesleyan, 1974; M.A., 1975.

PAUL FREDERICK CUTTER, *Professor of Music*, 1968.
B.A., California (Los Angeles), 1960; M.A., Harvard, 1962; M.F.A., Princeton, 1964; Ph.D., 1969.

ANN ABERNATHY DAGHISTANY, *Assistant Professor of English*, 1972,
B.A., Boston, 1963; Ph.D., Southern California, 1971.

BILLIE EUGENE DAHL, *Professor of Range Management*, 1967.
B.S., Oklahoma State, 1951; M.S., Utah State, 1953; Ph.D., Idaho, 1966.

JOHN R. DARLING, *Professor of Business Administration and Vice President for Academic Affairs*, 1981.
B.S., Alabama, 1959; M.S., 1960; Ph.D., Illinois (Urbana), 1967.

KAMALAKSHA DAS GUPTA, *Professor of Physics,* 1966.
B.S., Calcutta (India), 1937; M.S., 1940; Ph.D., Liverpool (England), 1952.

PURNENDU KUMAR DASGUPTA, *Assistant Professor of Chemistry,* 1981.
B.Sc., Burdwan (India), 1968; M.Sc., 1970; Ph.D., Louisiana State, 1977.

JAMES M. DAVENPORT, *Associate Professor of Mathematics,* 1972.
B.A., West Texas State, 1964; M.S., Southern Methodist, 1969; Ph.D., 1971.

MONTY EARL DAVENPORT, *Professor of Mechanical Engineering,* 1956.
B.S. in M.E., Texas Tech, 1956; M.S., Stanford, 1958; Ph.D., 1962; Reg. Prof. Engr. (Texas).

BERNARD DAVIDSON, *Assistant Professor of Home and Family Life,* 1980.
B.A., Seton Hall, 1973; M.A., Fairleigh Dickinson, 1976; Ph.D., Georgia, 1980.

C. JUDY DAVIDSON, *Instructor in Geography,* 1972.
B.A., Connecticut, 1963; M.A., Syracuse, 1965.

CLAUD MONROE DAVIDSON, *Professor of Geography,* 1969.
B.A., North Texas State, 1960; M.A., Texas (Austin), 1966; Ph.D., 1971.

LEWIS JAMES DAVIES, SR., *Associate Professor of Sociology,* 1962.
B.A., Texas (Austin), 1947; M.A., 1950; Ph.D., Illinois, 1960.

BOB DAVIS, *Associate Professor of Agricultural Economics,* 1977.
B.S., Texas A&M, 1961; M.S., 1962; Ph.D., North Carolina State, 1969.

DALE W. DAVIS, *Associate Professor of English,* 1968.
B.A., Central State U., 1961; M.A., Oklahoma, 1964; Ph.D., 1968.

EVELYN DAVIS, *Assistant Professor of Family Management, Housing, and Consumer Science,* 1980.
B.S., Southern Mississippi, 1964; M.S., 1970; Ph.D., Tennessee (Knoxville), 1979.

GORDON WAYNE DAVIS, *Assistant Professor of Animal Science and Food Technology,* 1980.
B.S., Washington State, 1968; M.S., Texas A&M, 1974; Ph.D., 1977.

GREGORY S. DAVIS, *Captain, U.S.A., Assitant Professor of Military Science,* 1982.
B.S., Auburn, 1974.

JAMES THERON DAVIS, *Assistant Professor of Architecture,* 1982.
B.F.A., Southern Mississippi, 1966; M.A.Ed., 1973; M.F.A., Mississippi, 1981.

JIMMY A. DAVIS, *Captain, U.S.A.F., Assistant Professor of Aerospace Studies,* 1982.
B.B.A., Mississippi, 1977; M.B.A., North Dakota, 1980.

KENNETH WALDRON DAVIS, *Professor of English,* 1955.
B.A. Texas Tech, 1954; M.A., Vanderbilt, 1955; Ph.D., 1963.

LORA CHING DEAHL, *Assistant Professor of Music,* 1973.
B.M., Oberlin Conservatory of Music, 1972; M.M., Indiana, 1975.

ROBERT WALDO DEAHL, *Professor and Associate Chairperson, Department of Music,* 1958.
B.M., Oberlin, 1950; M.M., 1952.

WILLIAM FRANK DEAN, *Associate Professor of Mass Communications,* 1971.
B.B.A., Texas Tech, 1961; M.Ed., 1965; Ed.D., 1971.

JOHN FRED DEETHARDT, JR., *Associate Professor of Speech Communication,* 1968.
B.A., Indiana, 1951; M.A., Northwestern, 1964; Ph.D., 1967.

JACK DANTE DENARDO, *Lecturer in Industrial Engineering,* 1978.
B.S., Rutgers, 1951; B.S., Texas Tech, 1965.

ALICE McCREARY DENHAM, *Associate Professor of Education,* 1973.
B.A., Baylor, 1959; M.S., 1969; Ph.D., Texas A&M, 1974.

PHILIP ADAMS DENNIS, *Associate Professor and Chairperson, Department of Anthropology,* 1974.
B.A., Arizona, 1967; M.A., Cornell, 1969; Ph.D., 1973.

RAYMOND E. DESROSIERS, *Assistant Professor of Chemical Engineering,* 1981.
B.S., Rensselaer Polytechnic Inst., 1970; Ph.D., 1975.

DIPAK K. DEY, *Assistant Professor of Mathematics and Statistics,* 1982.
B.Stat., Indian Statistical Inst. (India), 1974; M.Stat., 1975; M.S., Purdue, 1977; Ph.D., 1980.

DONALD THADDEUS DIETZ, *Professor of Romance Languages,* 1976.
A.B., Notre Dame, 1961; M.A., Arizona, 1965; Ph.D., 1968.

PETER DIFFLEY, *Assistant Professor of Biological Sciences,* 1981.
B.S., Tulane, 1968; M.A., Montana, 1974; Ph.D., Massachusetts, 1978.

JAMES D. DILLARD, *Visiting Assistant Professor of Mass Communications,* 1983.
B.S., Sam Houston State, 1969; M.S., East Texas State, 1976.

JOHN MICHAEL DILLINGHAM, *Assistant Professor of Agricultural Education and Agricultural Engineering,* 1978.
B.S., Texas A&M, 1967; M.E., Texas Tech, 1972; Ph.D., Texas A&M, 1981.

PHILLIP RICK DINGUS, *Assistant Professor of Art,* 1982.
B.A., California (Santa Barbara), 1973; M.A., 1977, New Mexico; M.F.A., 1981.

KENNETH R. DIXON, *Associate Professor of Art,* 1975.
B.A., Drury, 1965; M.F.A., Arkansas, 1968.

PAUL N. DIXON, *Professor of Education and Area Coordinator, Educational Psychology,* 1975.
B.A., Texas (Austin), 1969; Ph.D., 1973.

NELSON CHARLES DOMETRIUS, *Assistant Professor of Political Science,* 1978.
A.B., Redlands, 1969; M.A., San Diego State, 1974; Ph.D., North Carolina, 1979.

MARY ELIZABETH DOOHAN, *Assistant Professor of Biological Sciences,* 1980.
B.Sc., Carleton (Ottawa), 1972; Ph.D., Wisconsin, 1978.

JOHN DIXON DOWNES, *Professor of Horticulture,* 1970.
B.S., West Virginia, 1942; M.S., 1951; Ph.D., Michigan State, 1955.

LESLIE J. DOWNS, *Instructor in English,* 1982.
B.S., Texas Tech, 1978; M.A., 1982.

LANCE D. DRAGER, *Assistant Professor of Mathematics,* 1983.
B.A., Minnesota, 1972; M.A., Brandeis, 1973; Ph.D., 1978.

ARTHUR LINCOLN DRAPER, *Associate Professor of Chemistry,* 1959.
B.A., Rice, 1948; M.A., 1949; Ph.D., 1951.

D. LYNN DRAWE, *Adjunct Professor of Range Management,* 1976.
B.S., Texas A&I, 1964; M.S., Texas Tech, 1967; Ph.D., Utah State, 1971.

HAROLD ERNEST DREGNE, *Horn Professor of Plant and Soil Science,* 1969.
B.S., Wisconsin State, 1938; M.S., Wisconsin, 1940; Ph.D., Oregon State, 1942.

LESLIE C. DREW, *Professor of Museum Science,* 1977.
B.S., Michigan State, 1951; M.S., 1957; Ph.D., 1963.

RICHARD ALBERT DUDEK, *Horn Professor and Chairperson, Department of Industrial Engineering,* 1958.
B.S. in M.E., Nebraska, 1950; M.S. in I.E., Iowa, 1951; Ph.D., 1956; Reg. Prof. Engr. (Texas and Iowa).

WILLIAM PARKS DUKES, *Professor of Finance and Associate Dean, College of Business Administration,* 1968.
B.S., Maryland, 1953; M.B.A., Michigan, 1958; Ph.D., Cornell, 1968.

FAYE H. DULCY, *Assistant Professor of Physical Therapy,* 1982.
B.S., Northwestern U. Medical School, 1972; M.M.Sc., Emory, 1981.

JERRY R. DUNN, *Associate Professor of Mechanical Engineering,* 1975.
B.S. in M.E., Lamar State Coll. of Technology, 1962; M.S. in M.E., Georgia Inst. of Technology, 1964; Ph.D., 1972; Reg. Prof. Engr. (Texas).

PATRICK M. DUNNE, *Associate Professor of Business Administration,* 1975.
B.S.B.A., Xavier, 1966; M.B.A., Michigan State, 1968; Ph.D., 1972.

BENJAMIN SANCHEZ DURAN, *Associate Professor of Mathematics and Statistics,* 1971.
B.S., Albuquerque, 1961; M.S., Colorado State, 1964; Ph.D., 1966.

DONALD L. DURLAND, *Professor of Art,* 1969.
B.F.A., Miami, 1956; M.A., Bradley, 1961.

MARVIN JOHN DVORACEK, *Associate Professor and Chairperson, Department of Agricultural Engineering and Technology,* 1962.
B.S., Texas A&M, 1953; B.S., 1959; M.S., California (Davis), 1962; Reg. Prof. Engr. (Texas).

BRUCE R. EBANKS, *Associate Professor of Mathematics,* 1977.
B.A., Austin Coll., 1972; M.M., Waterloo, 1973; Ph.D., 1977.

FLOYD EUGENE EDDLEMAN, *Professor of English*, 1958.
B.S.E., Central Arkansas, 1951; M.A., Arkansas, 1955; Ph.D., 1961.

J. HADLEY EDGAR, JR., *Professor of Law*, 1971.
B.A., Texas A&M, 1949; J.D., Texas, 1956; Member State Bar (Texas).

WILDRING SHERROD EDWARDS, *Associate Professor of Home and Family Life*, 1962.
B.S., Texas Tech, 1959; M.A., 1962.

JAHANGIR EFTEKHAR, *Visiting Assistant Professor of Mechanical Engineering*, 1983.
B.S. in M.E., Tehran, 1976; M.S.M.E., Texas (Arlington), 1979; Ph.D., 1983.

ARAL EGE, *Assistant Professor of Business Administration*, 1981.
B.S.I.E., Middle East Technical (Turkey), 1971; M.S.I.E., 1973; Ph.D., Syracuse, 1981.

ULRICH LEWIS EGGENBERGER, *Professor of Agricultural Education and Agricultural Engineering*, 1961.
B.S., Kansas State, 1952; M.S., 1956; Ph.D., Iowa State, 1964.

JAMES R. EISSINGER, *Professor of Law*, 1972.
B.A., Wartburg Coll., 1960; J.D., North Dakota, 1964; Member State Bar (North Dakota and Texas).

JOSEPH F. ELAM, *Instructor in Health, Physical Education, and Recreation*, 1982.
B.S., Indiana State, 1980; M.S., 1981.

GARY STEWART ELBOW, *Professor of Geography*, 1970.
B.S., Oregon State, 1960; M.A., Oregon, 1964; Ph.D., Pittsburgh, 1972.

MARGARET ELBOW, *Assistant Professor of Social Welfare*, 1980.
B.A., Willamette, 1963; M.S.W., Pittsburgh, 1967.

JEFFREY W. ELIAS, *Professor of Psychology*, 1978.
B.A., Allegheny Coll., 1968; M.A., Northern Illinois, 1972; Ph.D., West Virginia, 1974.

ARTHUR McAULEY ELLIOT, *Associate Professor of Biological Sciences*, 1961.
B.S., Minnesota, 1953; M.S., 1960; Ph.D., 1961.

PAUL RAYMOND ELLSWORTH, *Professor of Music*, 1954.
B.A., Hillsdale Coll., 1950; M.A., Teachers Coll., Columbia, 1956.

HARRIETT CAMILLA EMANUEL, *Assistant Professor of Law*, 1983.
B.A., Converse Coll., 1972; M.S., Medical U. of South Carolina, 1975; J.D., Mississippi, 1981; LL.M., New York, 1983; Member State Bar (Mississippi, South Carolina).

EROL EMRE, *Associate Professor of Computer Science and Electrical Engineering*, 1981.
B.S.E.E., Middle East Technical (Turkey), 1973; M.S.E.E., 1974; Ph.D., Southern California, 1976.

KEITH V. ERICKSON, *Professor and Chairperson, Department of Speech Communication*, 1973.
B.A., Washington State, 1965; M.A., Pennsylvania State, 1968; Ed.D., Michigan, 1972.

MIRIAM ERSHKOWITZ, *Professor of Political Science*, 1983.
B.S., New York, 1960; M.A., Rutgers, 1963; Ph.D., Pennsylvania State, 1973.

OYARA PETERSEN ESTEVES, *Associate Professor of Education*, 1973.
B.A., Brazil, 1950; M.S., Indiana, 1962; Ed.D., 1965.

DON E. ETHRIDGE, *Associate Professor of Agricultural Economics*, 1975.
B.S., Texas Tech, 1965; M.S., 1967; Ph.D., North Carolina State, 1970.

NANCY EWALT, *Instructor in Landscape Architecture*, 1978.
B.S., Oregon State, 1957; M.S., Texas Tech, 1981; Reg. Landscape Arch. (Texas, Washington).

ROBERT H. EWALT, *Associate Professor of Education and Vice President for Student Affairs*, 1973.
B.S., Oregon State, 1956; M.A., Illinois, 1961; Ph.D., 1967.

EARL T. FARLEY, *Visiting Assistant Professor of Engineering Technology*, 1982.
B.S. in E.E., Pittsburgh, 1960; M.S. in E.E., 1966.

DUDLEY FAVER, *Lecturer in Business Administration*, 1980.
B.A., Abilene Christian, 1937; M.S.A., George Washington, 1973.

BILLY WELDON FELTY, *Associate Professor of Architecture*, 1958.
B.Arch., Texas Tech, 1952; Reg. Arch. (Texas).

CLARA E. FENDLEY, *Instructor in English*, 1982.
B.A., Texas Tech, 1978; M.A., 1982.

DOROTHY JANE FILGO, *Associate Professor of Education,* 1960.
B.A., Baylor, 1942; M.A., Colorado State Coll., 1950.

ALDO FINCO, *Professor of Romance Languages,* 1968.
B.A., Boston, 1955; M.A., Middlebury, 1963; D.M.L., 1967.

JOHN H. FINLEY, *Major, U.S.A., Assistant Professor of Military Science,* 1982.
B.A., Oklahoma State, 1967; M.A., 1971.

DON W. FINN, *Assistant Professor of Business Administration,* 1980.
B.A., Texas Tech, 1967; M.B.A., Arkansas State, 1977; Ph.D., Arkansas, 1982.

JUDITH L. FISCHER, *Associate Professor of Home and Family Life,* 1979.
B.A. Denver, 1966; M.A., 1967; Ph.D., Colorado, 1973.

P. ERNESTO FISCHER-CALDERON, *Assistant Professor of Chemical Engineering,* 1982.
B.S., Nacional Mayor de San Marcos, 1975; M.E., Utah, 1980; Ph.D., 1982.

ERNEST BERTLY FISH, *Professor of Park Administration and Landscape Architecture,* 1973.
B.S., Colorado State, 1964; M.S., 1966; Ph.D., Arizona, 1973.

JAMES A. FITCH, *Assistant Professor of Health, Physical Education, and Recreation,* 1982.
B.S., Eastern Kentucky, 1969; M.H.Ed., Brigham Young, 1973; Ph.D., Southern Illinois, 1977.

JUDITH R. FLAGLE, *Assistant Professor of Occupational Therapy,* 1983.
B.S., Colorado State, 1970; M.S., 1982.

DAN LOUIE FLORES, *Assistant Professor of History,* 1978.
B.A., Northwestern State, 1971; M.A., 1972; Ph.D., Texas A&M, 1978.

GEORGE QUITMAN FLYNN, *Professor of History,* 1973.
B.S., Loyola U. of South, 1960; M.A., Louisiana State, 1962; Ph.D., 1966.

EUGENE PAUL FOERSTER, *Associate Professor of Agricultural Engineering and Technology,* 1969.
B.S., Texas A&M, 1959; M.S., Texas Tech, 1965; Ph.D., Arizona, 1972; Reg. Prof. Engr. (Texas).

ARTHUR GAIL FOLLOWS, *Associate Professor of Music,* 1967.
B.M., Oberlin, 1956; M.M., Michigan, 1958.

ROBERT L. FOOTE, *Assistant Professor of Mathematics,* 1983.
B.S., Kalamazoo, 1976; M.A., Michigan, 1978; Ph.D., 1983.

KATHY H. FORD, *Part-time Instructor in Art,* 1979.
B.F.A., Texas Tech, 1973.

WAYNE TIMOTHY FORD, *Professor of Mathematics,* 1967.
B.A., Oklahoma City, 1952; M.A., Oklahoma, 1953; Ph.D., Rice, 1964.

EDWIN R. FOSTER, *Lecturer in Textile Engineering,* 1974.
B.S., Texas Tech, 1959.

JAMES MAURICE FOSTER, *Assistant Professor of English and Linguistics,* 1966.
B.S., Illinois, 1962; A.M., 1963; Ph.D., 1966.

DAVID GAYLE FOWLER, *Assistant Professor of Medical Technology,* 1983.
B.S., Mississippi State, 1974; MT(ASCP), Baptist Memorial Hospital (Memphis), 1975; M.C.S., Mississippi Medical Center, 1977.

STANLEY EARL FOWLER, *Professor of Home and Family Life,* 1970.
B.A., Baylor, 1947; M.A., George Peabody Coll., 1948; Ph.D., Florida State, 1955.

ELIZABETH A. FOX, *Assistant Professor of Food and Nutrition,* 1982.
B.S., Edgecliff Coll., 1956; M.S., State U. of Iowa, 1959; M.S., Michigan, 1968; Ph.D., 1974.

OSCAR FEDERICO FRANCKE, *Associate Professor of Biological Sciences,* 1976.
B.S., Arizona State, 1971; Ph.D., 1976.

CELESTE P. FRANK, *Instructor in Geography,* 1976.
B.S., Texas Tech, 1971; M.S., Texas A&M, 1976.

GREGORY A. FREDRICKS, *Assistant Professor of Mathematics,* 1978.
B.S., Oregon, 1970; M.A., Washington, 1971; Ph.D., Oregon State, 1976.

KRISTINE FREDRIKSSON, *Assistant Professor of Museum Science and Curator of History,* 1983.
A.B., Lindenwood Coll., 1963; Ph.D., California (Santa Barbara), 1982.

BILLY GERVICE FREEMAN, *Associate Professor of Agricultural Economics,* 1973.
B.S., Sam Houston State, 1958; M.Ed., 1960; M.S., Texas A&M, 1963; Ph.D., 1972.

ROBERT J. FREEMAN, *Professor of Accounting*, 1979.
B.S., Louisiana Tech, 1961; M.B.A., Arkansas, 1962; Ph.D., 1966; CPA.

BRYAN B. FULLER, *Assistant Professor of Biological Sciences*, 1980.
B.S., Michigan, 1971; Ph.D., Arizona, 1978.

BYRON FULLERTON, *Professor of Law and Dean, School of Law*, 1981.
B.S.P.Ed., Texas (Austin), 1946; M.Ed., Colorado, 1950; LL.B., Texas (Austin), 1956; Member State Bar (Texas).

CHARLOTTE M. FUNK, *Part-time Instructor in Art*, 1979.
B.S., Wisconsin (Whitewater), 1971; M.S., Illinois State, 1975; M.F.A., 1976.

VERNE FUNK, *Professor of Art*, 1977.
B.S., Wisconsin (Milwaukee), 1957; M.S., 1962; M.F.A., 1969.

H. FRANCIS FUSELIER, *Assistant Professor of Theatre Arts*, 1981.
B.A., Louisiana Coll., 1962; M.F.A., Tulane, 1974.

ROBERT E. GADES, *Associate Professor of Education*, 1982.
B.S., St. Cloud, 1956; M.A., Sul Ross, 1961; Ed.D., North Texas, 1967.

SHASHI K. GADIA, *Assistant Professor of Computer Science*, 1981.
B.Sc., Birla Inst. of Technology and Science (India), 1970; M.Sc., 1971; Ph.D., Illinois, 1978; M.S. in C.S., Ohio State, 1980.

RONALD DALE GALYEAN, *Associate Professor of Animal Science and Food Technology*, 1977.
B.S., Southwest Missouri State, 1966; M.S., Missouri (Columbia), 1972; Ph.D., 1975.

JEFFREY M. GAMSO, *Instructor in English*, 1977.
B.A., Pittsburgh, 1971; M.A., Michigan State, 1973.

JOHN R. GANNAWAY, *Adjunct Professor of Plant and Soil Science*, 1982.
B.S., Texas A&M, 1963; M.S., 1971; Ph.D., 1973.

EDMUNDO GARCIA-GIRON, *Professor of Romance Languages*, 1972.
B.A., California (Berkeley), 1940; M.A., 1947; Ph.D., 1952.

WILLIAM LAWRENCE GARVIN, *Professor, Division of Architecture*, 1978.
B.S., Washington and Lee, 1948; B.Arch., Ohio State, 1952; M.Arch., Massachusetts Inst. of Technology, 1958.

MARY SUE GATELY, *Assistant Professor of Accounting*, 1981.
B.S., Houston (Clear Lake), 1977; M.B.A., 1980; Ph.D., 1981; CPA.

HAROLD W. GAUSMAN, *Adjunct Professor of Plant and Soil Science and Biology*, 1982.
B.S., Maine, 1949; M.S., Illinois, 1950; Ph.D., 1952.

CHARLES P. GEER, *Assistant Professor of Education*, 1979.
B.A., San Francisco State, 1965; M.A., 1967; Ph.D., Arizona State, 1978.

CLAY EDWIN GEORGE, *Professor of Psychology*, 1967.
B.S., Arizona State, 1949; M.A., Arizona, 1953; Ph.D., Houston, 1962.

EDWARD V. GEORGE, *Professor of Classics*, 1971.
B.A., Niagara, 1959; M.S. in Ed., Canisius Coll., 1962; M.A., Wisconsin, 1962; Ph.D., 1966.

MARY AGNES GERLACH, *Associate Professor of Clothing and Textiles*, 1955.
B.S., Nebraska (Lincoln), 1937; M.A., 1951.

MICHAEL C. GERLACH, *Associate Professor of Theatre Arts*, 1982.
B.A., Fairleigh Dickinson, 1962; M.A., Michigan, 1964; Ph.D., 1971.

GEORGETTE ELIZABETH GETTEL, *Associate Professor of Music*, 1963.
B.M., Northwestern, 1956; M.M., Indiana, 1966.

JOHN RICHARD GIARDINO, *Assistant Professor of Geography*, 1978.
B.S., Southern Colorado, 1969; M.A., Arizona State, 1971; Ph.D., Nebraska, 1979.

HUGH JAMES GIBBONS, *Professor of Art*, 1963.
B.A., Pennsylvania State, 1959; M.A., 1961.

BEVERLY DIANE GILBERT, *Associate Professor of English*, 1961.
B.A., Baylor, 1958; M.A., Duke, 1961; Ph.D., 1968.

RONALD D. GILBERT, *Associate Professor of Economics*, 1977.
B.A., Oklahoma State, 1965; M.S., 1968; Ph.D., 1970.

GARRETT GILL, *Assistant Professor of Landscape Architecture,* 1983.
BSLA, Wisconsin, 1975; MLA, Texas A&M, 1977; Reg. Landscape Arch. (Texas).

JOHN ARTHUR GILLAS, *Professor of Music,* 1971.
B.M., Indiana. 1955; M.S., 1974.

MARY GILLAS, *Lecturer in Music,* 1977.

DAVID S. GILLIAM, *Assistant Professor of Mathematics,* 1977.
B.S., Idaho State, 1969; M.S., 1971; Ph.D., Utah, 1977.

JOHN CHARLES GILLIAM, *Professor of Economics,* 1962.
B.A., Western State Coll. of Colorado, 1951; M.B.Ed., Colorado, 1952; Ph.D., Iowa, 1959.

JACK R. GIPSON, *Associate Professor of Plant Physiology,* 1977.
B.S., Texas A&M, 1957; M.S., 1959; Ph.D., 1967.

EDNA SMITH GLENN, *Associate Professor of Art,* 1968.
B.A., Central Methodist Coll. (Missouri), 1937; M.A., North Texas State, 1975.

ULRICH GOEBEL, *Professor of German and Chairperson, Department of Germanic and Slavic Languages,* 1979.
B.A., Oregon, 1964; M.A., 1965; Ph.D., Ohio State, 1972.

JOE RAY GOODIN, *Professor of Biological Sciences,* 1970.
B.S., Texas Tech, 1955; M.S., Michigan State, 1958; Ph.D., California (Los Angeles), 1962.

JAMES ARTHUR GOSS, *Professor of Anthropology and Museum Science,* 1978.
B.A., Oregon, 1960; A.M., Chicago, 1962; Ph.D., 1972.

EDNA MAYNARD GOTT, *Assistant Professor of Economics,* 1954.
B.A., Texas (Austin), 1942; M.A., Texas Tech, 1954.

PRESTON FRAZIER GOTT, *Associate Professor of Physics,* 1949.
B.S., Texas (Austin), 1944; M.A., 1947.

LYMAN MOODY GRAHAM, JR., *Associate Professor of Engineering Graphics,* 1956.
B.S., North Texas State, 1943; M.S., 1949.

JAMES WILTON GRAVES, *Professor of Agricultural Economics,* 1961.
B.S., Cornell, 1952; M.S., Texas A&M, 1958; Ph.D., Michigan State, 1964.

BARBARA LAYENETTE GREEN, *Assistant Professor of History,* 1983.
B.A., Presbyterian Coll., 1973; M.A., North Texas State, 1975; Ph.D., Missouri, 1980.

RAYMOND ACKERLY GREEN, *Assistant Professor of Business Administration,* 1956.
B.S., Abilene Christian, 1947; M.A., Hardin-Simmons, 1950.

ROGER L. GREENE, *Associate Professor of Psychology,* 1974.
B.A., Colorado, 1966; M.S., New Mexico Highlands, 1967; Ph.D., Washington State, 1974.

KAREN SYDNEY GREENEBAUM, *Assistant Professor of Art,* 1983.
B.F.A., Rochester Inst. of Technology, 1982; M.A., Western Carolina, 1983.

JOHN B. GREINER, *Lecturer in Agricultural Engineering and Technology,* 1983.
B.S.A.E., Virginia Polytechnic Inst., 1937; M.S., Purdue, 1939.

WALTER GRUB, *Professor of Agricultural Engineering and Technology,* 1966.
B.S., Rutgers, 1949; M.S., Cornell, 1953; Reg. Prof. Engr. (Texas)

WILLIAM BARNETT GUERRANT, JR., *Professor of Chemistry,* 1968.
B.A., Austin Coll., 1946; Ph.D., North Carolina, 1949.

BEN R. GUNN, *Lecturer in Engineering Technology,* 1982.
B.S. in Ch.E., Texas Tech, 1958; M.S., 1960.

A. WILLIAM GUSTAFSON, *Associate Professor and Acting Chairperson, Department of Family Management, Housing, and Consumer Science,* 1978.
B.S., Southern Illinois, 1970; M.S., 1973; Ph.D., Illinois (Urbana-Champaign), 1976.

DONALD LLOYD GUSTAFSON, *Associate Professor of Electrical Engineering and Computer Science,* 1971.
B.S., Minnesota, 1960; M.S.E.E., 1966; Ph.D., 1971; Reg. Prof. Engr. (Texas).

WILLIAM HOWARD GUSTAFSON, *Associate Professor of Mathematics,* 1976.
B.A., Wesleyan, 1966; M.A., Illinois, 1967; Ph.D., 1970.

FRED S. GUTHERY, *Associate Professor of Wildlife Management,* 1977.
B.S., Oregon State, 1970; M.S., Texas A&M, 1972; Ph.D., 1977.

NECIP GÜVEN, *Professor of Geosciences*, 1972.
Ph.D., Göttingen, Germany, 1962.

MARION OTHO HAGLER, *Horn Professor and Acting Chairperson, Department of Electrical Engineering*, 1967.
B.A., Rice, 1962; B.S., 1963; M.S., Texas (Austin), 1964; Ph.D., 1967.

CHARLES G. HALCOMB, *Professor of Psychology*, 1964.
A.B., Oklahoma Baptist, 1958; Ph.D., Baylor, 1964.

ELIZABETH G. HALEY, *Professor of Home and Family Life and Dean, College of Home Economics*, 1981.
B.S., Louisiana Tech, 1966; M.S., Florida State, 1968; Ph.D., 1972.

ELIZABETH RAY HALL, *Assistant Professor of Health, Physical Education, and Recreation*, 1981.
B.S., North Texas State, 1972; M.A., 1979; Ph.D., Texas Woman's, 1981.

THOMAS R. HAMILTON, *Lieutenant Colonel, U.S.A., Professor of Military Science*, 1981.
B.B.A., Texas A&M, 1961; M.Ed., St. Lawrence, 1973.

CURT E. HAMRE, *Associate Professor of Speech and Hearing Sciences*, 1979.
B.A., Moorhead State, 1964; M.A., 1966; Ph.D., Washington (Seattle), 1968.

LIAM (WILLIAM) P. HANLY, *Instructor in Biblical Literature*, 1979.
Lic. in Sacred Theology, Catholic U., 1953; Lic. in Philosophy, Gregorian U., 1958; M.A., Detroit, 1960.

JAMES WALTER HANNA, *Associate Professor of Art*, 1968.
B.A., Austin Coll., 1960; M.A., North Texas State, 1973.

PAUL DEAN HANNA, JR., *Professor of Art*, 1960.
B.A., Austin Coll., 1951; M.F.A., Texas Christian, 1965.

PHILIP J. HANNON, *Associate Professor of Political Science*, 1974.
B.A., Colorado, 1961; J.D., Stanford, 1964; Ph.D., Claremont, 1969; Member State Bar (California).

TIMOTHY L. HANSEN, *Visiting Assistant Professor of Landscape Architecture*, 1983.
B.Arch., North Dakota State, 1974; MLA, Texas A&M, 1978; Reg. Landscape Arch. (Kansas, Texas).

DONALD ROBERT HARAGAN, *Professor of Atmospheric Science and Associate Dean, College of Arts and Sciences*, 1969.
B.S., Texas, 1959; M.S., Texas A&M, 1960; Ph.D., Texas, 1969; Reg. Prof. Engr. (Texas).

RICHARD PAUL HARBER, JR., *Assistant Professor of Economics*, 1980.
B.A., Vanderbilt, 1975; M.S., Illinois, 1978; Ph.D., 1982.

MARGARETTE L. HARDEN, *Assistant Professor of Food and Nutrition*, 1967.
B.S., Texas Tech, 1964; M.S., 1967; R.D.

MARTIN HARDWICK, *Assistant Professor of Computer Science*, 1982.
B.Sc., Bristol, 1978; Ph.D., 1982.

DENNIS ANDREW HARP, *Associate Professor of Telecommunications*, 1973.
B.S., Southwest Texas State, 1965; M.S., East Texas State, 1966; Ed.D., 1972.

SHELLEY SUE HARP, *Assistant Professor of Clothing and Textiles*, 1982.
B.S., Lamar, 1972; M.S., Texas Tech, 1977; Ph.D., Texas Woman's, 1982.

JAMES WILLIAM HARPER, *Associate Professor of History*, 1967.
B.S., Marshall, 1963; M.A., 1964; Ph.D., Virginia, 1968.

GARY A. HARRIS, *Associate Professor of Mathematics*, 1977.
B.S., Carson-Newman, 1969; M.S., Kentucky, 1971; Ph.D., 1977.

JEANETTE GREGORY HARRIS, *Assistant Professor of English*, 1982.
B.A., East Texas State, 1957; M.A., 1957; Ed.D., 1977.

LEILA A. HARRIS, *Lecturer in English*, 1983.
B.A., Federal U. of Rio de Janiero, 1973; M.A., Texas Tech, 1975.

PETER G. HARRIS, *Instructor in English*, 1981.
B.A., State U. of New York (Buffalo), 1963; M.A., Texas Tech, 1968; Ph.D., 1983.

RAE LAWRENCE HARRIS, JR., *Professor of Geosciences*, 1957.
B.S., Oregon State, 1950; Ph.D., Columbia, 1957.

VIRGINIA BUTLER HARRIS, *Lecturer in Education,* 1980.
B.S.Ed., Texas Tech, 1952; M.Ed., 1955; Ed.D., 1980.

BEN S. HARRISION, *Instructor in Geosciences,* 1981.
B.S., Southern Methodist, 1949; M.S., Texas Tech, 1981.

KENNETH EUGENE HARRISON, *Assistant Professor of Business Administration,* 1981.
B.B.A., Wisconsin (Madison), 1974; M.S., Arizona State, 1975; Ph.D., Texas (Austin), 1983.

H. BERNARD HARTMAN, *Associate Professor of Biological Sciences,* 1975.
B.S., Maryland, 1960; M.S., American (Washington, D.C.), 1962; Ph.D., Connecticut, 1965.

WILLIAM G. HARTWELL, III, *Associate Professor of Music,* 1973.
A.B., Whitman Coll., 1961; Soloist's Diploma, 1961; M.M., Indiana (Bloomington), 1964.

JOHN H. HARVEY, *Professor and Chairperson, Department of Psychology,* 1982.
B.S., South Carolina, 1968; M.A., Missouri (Columbia), 1970; Ph.D., 1971.

WILLIAM REID HASTIE, *Professor of Art,* 1970.
B.S., State Teachers Coll. (Pennsylvania), 1936; M.A., West Virginia (Morgantown), 1940; Ph.D., Pittsburgh, 1953.

ROBEN HATAMI, *Assistant Professor of Business Administration,* 1983.
B.A., Coll. of Statistics (Iran), 1974; M.B.A., Texas (Austin), 1978.

LYNN LAMAR HATFIELD, *Associate Professor of Physics,* 1968.
B.S., Arkansas Polytechnic Coll., 1960; M.S., Arkansas, 1964; Ph.D., 1966.

BILLY BURTON HATHORN, *Assistant Professor of History,* 1983.
B.A., Louisiana Tech, 1970; M.A., Northwestern State, 1980; Ph.D., Texas A&M, 1983.

MURRAY CLARK HAVENS, *Professor of Political Science,* 1973.
A.B., Alabama, 1953; M.A., Johns Hopkins, 1954; Ph.D., 1958.

DAVID HAYES, *Associate Professor of Restaurant, Hotel, and Institutional Management,* 1983.
B.S., Purdue, 1976, M.S., 1978, Ph.D., 1981.

ROBERT AMES HAYES, *Associate Professor of History,* 1968.
B.A., New Mexico, 1955; Ph.D., 1969.

JOHN MICHAEL HAYNES, *Lecturer in Journalism,* 1983.
B.A., Texas Tech, 1973.

PATRICK ALLEN HAYS, *Assistant Professor of Finance,* 1978.
B.S.C.E., Arkansas, 1965; M.B.A., California Western, 1970; Ph.D., North Carolina, 1977.

HUBERT REED HEICHELHEIM, *Associate Professor and Assistant Chairperson, Department of Chemical Engineering,* 1961.
B.S. in Ch.E., Notre Dame, 1953; M.S. in Ch.E., 1956; Ph.D., Texas (Austin), 1962; Reg. Prof. Engr. (Texas).

SCOTT E. HEIN, *Associate Professor of Finance,* 1983.
B.A., New Mexico, 1973; M.A., 1975; Ph.D., Purdue, 1979.

CARYL E. HEINTZ, *Associate Professor of Biological Sciences,* 1975.
A.B., Wittenberg, 1962; M.S., Cincinnati, 1965; Ph.D., Indiana, 1968.

JAMES C. HEIRD, *Assistant Professor of Animal Science,* 1976.
B.S., Tennessee, 1970; M.S., 1971; Ph.D., Texas Tech, 1978.

PETER L. HELLER, *Associate Professor of Sociology,* 1973.
A.B., Indiana Central Coll., 1960; M.A., Pennsylvania State, 1964; Ph.D., Nevada (Reno), 1972.

J. M. HELLMAN, *Lecturer in Animal Science and University Veterinarian,* 1976.
B.S., Texas A&M, 1967; D.V.M., 1968.

DONALD JACOB HELMERS, *Professor of Engineering Technology and Mechanical Engineering,* 1948.
B.S. in M.E., Texas Tech, 1948; M.S., Michigan, 1950; Ph.D., Texas A&M, 1965; Reg. Prof. Engr. (Texas).

A. KATHLEEN HENNESSEY, *Associate Professor of Computer Science,* 1982.
B.A., Stanford, 1957; HSA(B), Toronto, 1968; Ph.D., Lancaster (England), 1982.

NANCY PARROTT HICKERSON, *Associate Professor of Anthropology and Linguistics,* 1972.
B.A., Barnard, 1948; M.A., Indiana, 1950; Ph.D., 1957.

DAVID LEON HIGDON, *Horn Professor of English*, 1971.
B.A., Oklahoma City, 1962; M.A., Kansas, 1964; Ph.D., 1968.

SHELBY KEITH HILDEBRAND, *Professor of Mathematics*, 1963.
B.A., North Texas State, 1952; M.A., 1957; Ph.D., Iowa State, 1962.

LEWIS EDGAR HILL, *Professor of Economics*, 1967.
B.A., Texas (Austin), 1947; M.A., 1948; Ph.D., 1957.

A. SCOTT HOLADAY, *Assistant Professor of Biological Sciences*, 1983.
B.S., Illinois, 1971; M.S., Florida, 1973; Ph.D., 1978.

RONALD J. HOLIHAN, *Instructor in Health, Physical Education, and Recreation*, 1979.
B.S., Eastern Kentucky, 1972; M.S., 1973.

JAMES EDWARD HOLLAND, *Assistant Professor of Classical Languages and Linguistics*, 1967.
A.B., William Jewell Coll., 1963; M.A., Washington, 1966; Ph.D., Missouri, 1976.

ROBERT ALAN HOLWERDA, *Associate Professor and Associate Chairperson, Department of Chemistry*, 1974.
B.S., Stanford, 1969; Ph.D., California Inst. of Technology, 1973.

PATRICIA MARY HOPKINS, *Assistant Professor of Romance Languages*, 1969.
B.A., St. Joseph, 1962; Ph.D., Missouri (Columbia), 1969.

NORMAN W. HOPPER, *Associate Professor of Agronomy*, 1976.
B.S., Texas Tech, 1965; M.S., 1967; Ph.D., Iowa State, 1970.

JUDITH A. HORA, *Lecturer in Business Administration*, 1981.
B.A., California (Los Angeles), 1970; M.S., Texas Tech, 1981.

STEPHEN C. HORA, *Associate Professor of Business Administration*, 1977.
B.S., Southern California, 1964; D.B.A., 1973.

PATRICIA EMILY HORRIDGE, *Associate Professor and Chairperson, Department of Clothing and Textiles*, 1976.
B.S., Texas, 1958; M.S., Houston, 1965; Ph.D., Texas Woman's, 1969.

BARBARA GAIL HOUSE, *Assistant Professor of Family Management, Housing, and Consumer Science*, 1973.
B.S., Texas Tech, 1970; M.S., 1975; Ph.D., 1979.

LARRY M. HOVEY, *Associate Professor of Education*, 1970.
B.S., Illinois, 1964; M.Ed., 1965; Ph.D., California (Berkeley), 1970.

DAVID ALLEN HOWE, *Associate Professor of Physics*, 1963.
B.S., Indiana, 1958; Ph.D., 1962.

JOHN McDONALD HOWE, *Assistant Professor of History*, 1981.
B.A., San Francisco, 1969; M.A., California (Los Angeles), 1971; Ph.D., 1979.

ROY HOWELL, *Associate Professor of Marketing*, 1982.
B.B.A., Eastern New Mexico, 1973; M.B.A., 1974; Ph.D., Arkansas, 1979.

JAMES DEAN HOWZE, *Professor of Art*, 1958.
B.A., Austin Coll., 1951; M.S., Michigan, 1958.

HOWER J. HSIA, *Professor of Mass Communications*, 1970.
B.S., Southwest Military Academy, 1945; M.S., Brigham Young, 1961; Ph.D., Wisconsin, 1967.

FRANK ALDEN HUDSON, *Professor of Animal Science*, 1960.
B.S., Arizona State, 1952; M.S., New Mexico State, 1953; Ph.D., Oregon State, 1957.

JANICE MARIE HUDSON, *Instructor in Health, Physical Education, and Recreation*, 1975.
B.S., Lamar, 1966; M.Ed., Sam Houston State, 1972.

JERRY C. HUDSON, *Associate Professor of Mass Communications*, 1978.
B.S., West Texas State, 1971; M.A., 1972; Ph.D., North Texas State, 1980.

LYNN HUFFMAN, *Assistant Professor of Restaurant, Hotel, and Institutional Management*, 1980.
B.S., Sam Houston State, 1967; M.S., Texas A&M, 1974; Ph.D., 1977.

D. L. (LIN) HUGHES, *Assistant Professor of Political Science*, 1979.
B.A., Tarleton, 1969; M.A., North Texas State, 1975; Ph.D., 1981.

DEAN WINSTON HUGHES, *Associate Professor of Agricultural Economics*, 1983.
B.A., Princeton, 1972; M.S., Purdue, 1975; Ph.D., Texas A&M, 1980.

CHRISTINE ANN HULT, *Assistant Professor of English*, 1982.
B.A., Idaho, 1975; M.A., 1978; Ph.D., Michigan, 1982.

DONALD M. HUNT, *Adjunct Professor of Law*, 1974.
B.A., McMurry, 1956; LL.B., Texas (Austin), 1961; Member State Bar (Texas).

IRMGARD ELSNER HUNT, *Visiting Assistant Professor of German*, 1983.
B.A., Alaska, 1974; M.A., 1975; Ph.D., Washington, 1982.

JAMES G. HUNT, *Professor of Business Administration and Area Coordinator, Management*, 1981.
B.S., Michigan Technological, 1954; M.A., Illinois, 1958; Ph.D., 1966.

LOUIS R. HUNT, *Professor of Mathematics*, 1969.
B.S., Baylor, 1964; Ph.D., Rice, 1970.

SHELBY D. HUNT, *Horn Professor of Marketing*, 1980.
B.S., M.E., Ohio, 1962; Ph.D., Michigan State, 1968.

JOHN RAY HUNTER, *Associate Professor of Range and Wildlife Management*, 1958.
B.S., Midwestern, 1949; M.Ed., Texas Tech, 1958.

N. JANE HURT, *Assistant Professor of Architecture*, 1981.
B.Arch., Pennsylvania State, 1970; M.Env.Des., Yale, 1972; Reg. Arch. (Maryland).

KATHERINE S. HUTMACHER, *Assistant Professor of Landscape Architecture*, 1979.
B.S., California (Davis), 1976; M.L.A., Texas A&M, 1979; Reg. Landscape Arch. (Texas).

CARMINE U. IACONO, *Assistant Professor of Psychology*, 1981.
B.A., Rhode Island, 1967; Ed.M., Rhode Island Coll., 1969; Ph.D., Missouri (Columbia), 1975.

RAOUF A. IBRAHIM, *Assistant Professor of Mechanical Engineering*, 1980.
B.S., Cairo (Egypt), 1963; M.S., 1969; Ph.D., Edinburgh (Scotland), 1974; Reg. Prof. Engr. (Texas).

WILLIAM KEITH ICKES, *Professor of Speech and Hearing Sciences*, 1962.
B.S., Utah, 1948; M.S., 1949; Ph.D., Southern Illinois, 1960.

JESSE C. INGRAM, *Assistant Professor of Psychology*, 1981.
B.A., Bishop Coll., 1972; M.A., Texas Tech, 1974; Ph.D., Nebraska (Lincoln), 1981.

DONNA A. IRONS, *Lecturer in Education*, 1981.
B.A., Stephen F. Austin State, 1971; M.Ed., Texas Woman's, 1975; Ed.D., Texas Tech, 1980.

THOMAS RAY IRONS, *Assistant Professor of Education*, 1981.
B.A., Texas Tech, 1972; M.A., 1973; Ed.D., 1980.

RICHARD E. ISHLER, *Professor and Dean, College of Education*, 1983.
B.S., Lock Haven State, 1957; M.Ed., Pennsylvania State, 1960; Ed.D., 1965.

ALONZO DAVID JACKA, *Professor and Acting Chairperson, Department of Geosciences*, 1959.
B.S., Beloit, 1953; M.S., Wisconsin, 1957; Ph.D., Rice, 1960.

RAYMOND CARL JACKSON, *Professor of Biological Sciences*, 1971.
A.B., Indiana, 1952; A.M., 1953; Ph.D., Purdue, 1955.

THEODORE K. JAMES, *Associate Professor of Occupational Therapy*, 1983.
B.S., Colorado State, 1956; Cert. in OT, 1957; M.S., Western Reserve, 1963.

JEANETTE MARION DAVIS JENKINS, *Assistant Professor of Home and Family Life*, 1962.
B.S., Southern California, 1947; M.Ed., Texas Tech, 1955; Ed.D., North Texas State, 1976.

WILLIAM LOYD JENKINS, *Associate Professor of Industrial Engineering and Engineering Technology*, 1946.
B.S., Texas Tech, 1943; M.S. in S.E., Georgia Inst. of Technology, 1951; Reg. Prof. Engr. (Texas).

HARVEY JOANNING, *Associate Professor of Home and Family Life*, 1976.
B.A., Briar Cliff, 1969; M.A., Iowa, 1972; Ph.D., 1973.

EVAN K. JOBE, *Assistant Professor of Philosophy*, 1976.
B.A., Indiana, 1949; M.A., Florida, 1965; Ph.D., Indiana, 1973.

BETTYE JOHNSON, *Associate Professor of Education*, 1970.
B.S., Tennessee Technological, 1958; M.S., Tennessee, 1960; Ed.D., 1962.

DEE LAMONT JOHNSON, *Associate Professor of Education*, 1978.
B.A., Brigham Young, 1964; M.A., 1968; Ph.D., 1972.

EILEEN JOHNSON, *Assistant Professor of Museum Science and Curator of Archaeology*, 1981.
B.A., California (Berkeley), 1968; M.A., Kansas, 1972; Ph.D., Texas Tech, 1976.

MELVIN JOHNSON, *Associate Professor of Architecture*, 1980.
B.F.A., Art Inst. of Chicago, 1957; M.F.A., 1961.

CLYDE JONES, *Professor and Chairperson, Department of Museum Science*, 1982.
B.A., Hastings Coll., 1957; M.S., New Mexico, 1957; Ph.D., 1964.

CYNTHIA LANFORD JONES, *Assistant Professor of Speech and Hearing Sciences*, 1982.
B.S., Georgia State, 1978; M.Ed., 1979.

DARYL EMRYS JONES, *Professor and Chairperson, Department of English*, 1973.
B.A., Michigan State, 1968; M.A., 1970; Ph.D., 1974.

J. KNOX JONES, JR., *Professor of Biological Sciences, Dean, Graduate School, and Vice President for Research and Graduate Studies*, 1971.
B.S., Nebraska, 1951; M.A., Kansas, 1953; Ph.D., 1962.

JESSE JONES, *Lecturer in Mechanical Engineering*, 1981.
B.S. in M.E., Texas Tech, 1955; B.S. in C.E., 1957; M.S. in M.E., Houston, 1966.

WILLIAM B. JONES, JR., *Associate Professor of Mechanical Engineering*, 1982.
B.S., Texas Tech, 1959; M.S., 1960; Ph.D., Utah, 1970.

JAMES E. JONISH, *Professor of Economics*, 1973.
B.A., Illinois, 1963; M.A., 1964; Ph.D., Michigan, 1969.

DUANE PAUL JORDAN, *Associate Professor of Mechanical Engineering*, 1964.
B.S., Stanford, 1957; M.S., 1958; Ph.D., 1961; Reg. Prof. Engr. (Texas).

WILLIAM J. JORDAN, *Professor of Speech Communication*, 1973.
B.A., Houston, 1965; M.A., 1966; Ph.D., Wayne State, 1969.

STEPHEN JORGENSEN, *Associate Professor of Home and Family Life and Associate Dean, College of Home Economics*, 1982.
B.A., Hamline, 1971; Ph.D., Minnesota, 1976.

GERALD MICHAEL JURICA, *Associate Professor of Atmospheric Science*, 1975.
B.E.E., Detroit, 1963; M.S., Arizona, 1966; Ph.D., 1970.

MARIHELEN KAMP, *Assistant Professor of Biological Sciences*, 1982.
B.S., Texas Tech, 1965; M.S., 1976; Ph.D., Texas A&M, 1980.

GEORGE M. KASPER, *Assistant Professor of Business Administration*, 1983.
B.S., State U. of New York (Brockport), 1974; M.B.A., State U. of New York (Buffalo), 1978.

BASHIR AHMAD KAZIMEE, *Lecturer in Architecture*, 1981.
B.Arch., Kabul (Afghanistan), 1973; M.Arch.A.S., Massachusetts Inst. of Technology, 1977.

BRADFORD POWELL KEENEY, Associate Professor of Home and Family Life, 1984.
B.S., Arizona State, 1974; M.A., Missouri, 1976; Ph.D., Purdue, 1981.

CLIFF HUTCHINSON KEHO, *Associate Professor of Civil Engineering*, 1957.
B.S., Swarthmore, 1947; M.S., Harvard, 1948; Reg. Prof. Engr. (Texas).

KENT R. KEIM, *Assistant Professor of Plant Breeding*, 1979.
B.S., Minnesota, 1973; M.S., Oklahoma State, 1975; Ph.D., Nebraska, 1979.

CHARLES N. KELLOGG, *Associate Professor of Mathematics*, 1970.
B.S., New Mexico Inst. of Mining and Technology, 1960; Ph.D., Louisiana State, 1964.

VIRGINIA K. KELLOGG, *Professor of Music*, 1963.
B.M., Eastman School of Music, 1957; M.M., Illinois, 1961; D.M.A., Eastman School of Music, 1975.

CLYDE E. KELSEY, JR., *Professor of Education*, 1972.
B.A., Texas (El Paso), 1948; M.A., Tulsa, 1951; Ph.D., Denver, 1960.

REX PAGE KENNEDY, *Associate Professor of Agricultural Economics*, 1967.
B.S., Texas Tech, 1956; M.S., Texas A&M, 1962; Ph.D., 1970.

SABE McCLAIN KENNEDY, *University Professor (Political Science)*, 1946.
B.A., Texas Tech, 1943; M.A., 1946; Ph.D., Colorado, 1952.

SARAH ANN NIX KENNEDY, *Assistant Professor of Mathematics*, 1958.
B.S., Texas Tech, 1957; M.S., 1959.

LOIS LEE KERSCHEN, *Instructor in English*, 1982.
B.S., Marygrove Coll., 1972; M.A., Southern Mississippi, 1973.

RICHARD ORVILLE KESLIN, *Associate Professor of Anthropology,* 1964.
B.A., Wisconsin, 1952; M.A., 1957; Ph.D., 1961.

KENNETH LAINE KETNER, *Charles Sanders Peirce Professor of Philosophy,* 1971.
B.A., Oklahoma State, 1961; M.A., 1967; M.A., California (Los Angeles), 1968; Ph.D., California (Santa Barbara), 1972.

SAMINA KHAN, *Assistant Professor of Clothing and Textiles,* 1978.
B.S., Punjab (Pakistan), 1968; M.Sc., 1970; M.S., Illinois, 1974; Ph.D., Texas Woman's, 1978.

JOHN LORD KICE, *Professor of Chemistry and Associate Vice President for Research,* 1975.
A.B., Harvard, 1950; Ph.D., 1954.

ERNST WILLIE KIESLING, *Professor and Chairperson, Department of Civil Engineering,* 1956.
B.S., Texas Tech, 1955; M.S., Michigan State, 1959; Ph.D., 1966; Reg. Prof. Engr. (Texas).

ERNESTINE DOLORES KILCHENSTEIN, *Assistant Professor of Business Administration,* 1959.
B.B.A., Texas Tech, 1957; M.B.A., 1960.

*KEE S. KIM, *Assistant Professor of Finance,* 1981.
B.A., Yonsei (Korea), 1966; M.B.A., Washington, 1973; Ph.D., Texas (Austin), 1978.

YOUNG NOK KIM, *Professor of Physics,* 1964.
B.S., Seoul National (Korea), 1947; M.S., 1949; Ph.D., Birmingham (England), 1957.

PANZE BUTLER KIMMEL, *Associate Professor of Education,* 1964.
B.S. in Ed., Texas Tech, 1947; M.M., Texas (Austin), 1949; Ed.D., Texas Tech, 1964.

JOSEPH E. KING, *Associate Professor of History,* 1970.
B.A., Fordham, 1964; M.A., Illinois (Urbana-Champaign), 1965; Ph.D., 1971.

CLIVE J. KINGHORN, *Lecturer in Telecommunications,* 1970.
B.S., Brigham Young, 1966; M.A., Ohio, 1967; Ed.D., Oklahoma State, 1979.

JAMES WILLIAM KITCHEN, *Professor of Park Administration and Landscape Architecture,* 1964.
B.S., Texas Tech, 1951; M.S., 1952; Ph.D., Texas A&M, 1964.

THEODORE MICHAEL KLEIN, *Associate Professor of Classical Languages,* 1974.
B.A., U. of the Witwatersrand (Johannesburg), 1968; Ph.D., State U. of New York (Buffalo), 1973.

SHELDON CHARLES KLOCK, JR., *Assistant Professor of Romance Languages,* 1963.
B.A., Pan American, 1960; M.A., Tulane, 1963.

**DAVID BARRY KNAFF, *Professor of Chemistry,* 1976.
B.S., Massachusetts Inst. of Technology, 1962; M.S., Yale, 1963; Ph.D., 1966.

PAUL A. KNIPPING, *Associate Professor of Health, Physical Education, and Recreation,* 1976.
B.S., Lakeland Coll., 1948; M.S., Wisconsin (Madison), 1949; Ph.D., 1970.

ALBERTA KOCH, *Assistant Professor of Home and Family Life,* 1981.
B.A., California, 1970; M.A., Washington State, 1973; M.A., Southern California, 1980; Ph.D., 1981.

MARIE KOCH, *Associate Professor of Physical Therapy,* 1983.
B.S., St. Louis, 1965; M.S., Houston (Clear Lake City), 1981.

TIMOTHY W. KOCH, *Associate Professor of Finance and Continental National Bank Professor of Bank Management,* 1979.
B.A., Wartburg, 1972; M.S., Purdue, 1974; Ph.D., 1976.

SHIRLEY KOELLER, *Associate Professor of Education,* 1978.
A.B., California (Berkeley), 1957; M.A., Colorado, 1971; Ph.D., 1975.

DAVID E. KOEPPE, *Professor and Chairperson, Department of Plant and Soil Science,* 1981.
B.S., Wisconsin (Oshkosh), 1962; M.N.S., Oklahoma, 1965; Ph.D., 1968.

ROBERT JOHN KOESTER, *Professor of Business Administration,* 1976.
B.S., Nebraska, 1970; M.B.A., 1971; Ph.D., 1974; CPA; CMA.

JUSUCK KOH, *Associate Professor of Architecture and Adjunct Associate Professor of Landscape Architecture,* 1983.
B.Arch., Seoul National, 1965; M.L.A., Pennsylvania, 1975; Ph.D., 1978.

LILLIAN KOUNTZ, *Instructor in Clothing and Textiles,* 1970.
B.S., Texas Tech, 1951; M.Ed., 1954.

JOHN J. KOWALSKI, *Assistant Professor of Petroleum Engineering,* 1983.
B.S., Michigan State, 1960; Ph.D., 1963.

BILL KOZAR, *Associate Professor of Health, Physical Education, and Recreation*, 1970.
B.S.Ed., Western Illinois, 1963; M.S.Ed., 1965; Ph.D., Iowa, 1970.

JOHN E. KRAHMER, *Professor of Law*, 1971.
B.A., Iowa, 1965; J.D., 1966; LL.M., Harvard, 1967; Member State Bar (Iowa).

BRUCE M. KRAMER, *Professor of Law*, 1974.
A.B., California (Los Angeles), 1968; J.D., 1972; LL.M., Illinois (Champaign-Urbana), 1975; Member State Bar (California).

WALTER KRAUSE, *Adjunct Professor of Economics*, 1972.
B.A., Oregon; M.A.; Ph.D., Harvard, 1945.

LINDA A. KREFTING, *Associate Professor of Management*, 1981.
B.A., Minnesota, 1968; M.A., 1971; Ph.D., 1974.

LYNWOOD KRENECK, *Professor of Art*, 1965.
B.F.A., Texas (Austin), 1958; M.F.A., 1965.

DANIEL R. KRIEG, *Professor of Crop Physiology*, 1970.
B.S., Texas A&M, 1965; Ph.D., 1970.

THOMAS F. KRILE, *Associate Professor of Electrical Engineering*, 1979.
B.S. in E.E., North Dakota, 1963; M.S. in E.E., 1965; Ph.D., Purdue, 1968; Reg. Prof. Engr. (Texas).

MAGNE KRISTIANSEN, *Horn Professor of Electrical Engineering*, 1966.
B.S.E.E., Texas (Austin), 1961; Ph.D., 1967; Reg. Prof. Engr. (Texas).

HERMANN G. KROMPHOLZ, *Visiting Assistant Professor of Electrical Engineering*, 1982.
M.S., Technische Hochschule Darmstadt, 1971; Ph.D., 1977.

JOHN S. KUBIN, Colonel, U.S.A.F., *Professor of Aerospace Studies*, 1983.
B.S., Texas A&M, 1959; M.S., Air Force Inst. of Technology, 1973.

ALLAN JAMES KUETHE, *Professor of History*, 1967.
B.A., Iowa, 1962; M.A., Florida, 1963; Ph.D., 1967.

ERICH E. KUNHARDT, *Associate Professor of Electrical Engineering and Physics*, 1976.
B.S., New York, 1969; M.S., 1972; Ph.D., Polytechnic Inst. of New York, 1976.

CONSTANCE B. KURIYAMA, *Associate Professor of English*, 1982.
B.A., Indiana, 1964; M.A., California (Berkeley), 1966; Ph.D., 1973.

PAUL JOSEPH KUZDRALL, *Associate Professor of Business Administration*, 1982.
B.S.E. (M.E.), Michigan, 1966; M.B.A., Southern Illinois (Edwardsville), 1971; Ph.D., Saint Louis, 1977.

MARTIN THEODORE KYRE, JR., *Associate Professor of Political Science*, 1963.
B.A., Ohio Wesleyan, 1950; M.A., Washington, 1957; Ph.D., 1962.

NEVIN K. LAIB, *Assistant Professor of English*, 1981.
B.A., Whitman Coll., 1972; M.A., Washington State, 1974; Ph.D., Ohio State, 1982.

GOPAL D. LAKHANI, *Assistant Professor of Computer Science*, 1980.
M.Sc., Jiwaji (India), 1966; Ph.D., Indian Inst. of Technology (India), 1972; M.S. in C.S., Illinois, 1978.

NEVEN P. LAMB, *Associate Professor of Anthropology*, 1974.
B.A., Pennsylvania State, 1954; Ph.D., Arizona (Tucson), 1969.

BRIAN KERRY LAMBERT, *Associate Professor of Industrial Engineering*, 1967.
B.S. in I.E., Texas Tech, 1964; M.S. in I.E., 1966; Ph.D., 1967; Reg. Prof. Engr. (Texas).

JAMES M. LAMBERT, *Lecturer in Textile Engineering*, 1974.
B.B.A., Texas Tech, 1968.

CARLON S. LAND, *Professor of Petroleum Engineering*, 1983.
B.S. in Ch.E., Texas Tech, 1948; M.S. in P.E., Wyoming, 1966; Ph.D., 1974; Reg. Prof. Engr. (Wyoming).

TEDDY L. LANGFORD, *Professor of Nursing and Dean, School of Nursing*, 1979.
B.S.N., Incarnate Word, 1966; M.S.N., Texas System School of Nursing, 1970; Ph.D., Texas (Austin), 1974.

THOMAS ALEXANDER LANGFORD, *Professor of English and Associate Dean, Graduate School*, 1965.
B.A., California (Riverside), 1956; M.A., Texas Tech, 1963; Ph.D., Texas Christian, 1967.

CRAIG J. LANGSTRAAT, *Assistant Professor of Business Administration*, 1983.
B.S., Arizona State, 1972; J.D., 1978; LL.M., San Diego School of Law, 1982; CPA; Member State Bar (Arizona and California).

MURL A. LARKIN, *Professor of Law*, 1968.
LL.B., Southeastern, 1939; Diplomate, International Law and Relations, Naval War Coll., 1963; Member State Bar (Texas and District of Columbia); Admitted to Practice (U.S. Supreme Court).

RUSSELL DAVID LARSEN, *Associate Professor of Chemistry*, 1983.
B.A., Kalamazoo, 1957; Ph.D., Kent State, 1964.

MARK D. LARSON, *Assistant Professor of Business Administration*, 1982.
B.G.S., Iowa, 1973; M.H.L.R., Ohio State, 1980; Ph.D., 1983.

JOHN H. LAUCK II, *Instructor in English*, 1982.
B.A., Houston Baptist, 1980; M.A., Texas Tech, 1982.

CYLIAN MASON SKINNER LAW, *Assistant Professor of Home and Family Life*, 1966.
B.A., Alabama Coll., 1955; M.A., Mississippi, 1966.

JAMES HAROLD LAWRENCE, JR., *Professor and Chairperson, Department of Mechanical Engineering*, 1956.
B.S. in M.E., Texas Tech, 1956; M.S. in M.E., 1960; Ph.D., Texas A&M, 1965; Reg. Prof. Engr. (Texas).

PAULA J. LAWRENCE, *Associate Professor of Education*, 1976.
B.S., Tennessee, 1963; M.Ed., Arizona, 1971; Ed.D., 1974.

COLLEEN ANN LEARY, *Associate Professor of Atmospheric Science*, 1978.
S.B., Massachusetts Inst. of Technology, 1970; M.S., 1973; Ph.D., Washington, 1978.

DELLAS W. LEE, *Professor of Law*, 1974.
LL.B., British Columbia, 1959; LL.M., Illinois, 1962; S.J.D., Michigan, 1969; Member State Bar (British Columbia).

G. FRED LEE, *Professor of Civil Engineering*, 1982.
B.A., San Jose State, 1955; M.S., North Carolina, 1957; Ph.D., Harvard, 1960; Reg. Prof. Engr. (Texas).

HONG YONG LEE, *Professor of Agricultural Economics*, 1963.
B.S., Central Missouri State, 1959; M.S., Oklahoma State, 1962; Ph.D., 1967.

PHILLIP LEHRMAN, *Associate Professor of Music*, 1979.
B.M., Southern California, 1971; M.M., 1973.

LESLIE LEUPP, *Associate Professor of Art*, 1983.
B.A., Bethel Coll., 1968; M.F.A., Indiana, 1973.

DONALD K. LEW, *Captain, U.S.A., Assistant Professor of Military Science*, 1981.
B.S., Rhode Island, 1976.

IRA WAYNE LEWIS, *Associate Professor of Mathematics*, 1977.
B.S., Houston, 1972; M.S., Texas A&M, 1974; Ph.D., Texas (Austin), 1977.

TRUMAN ORVILLE LEWIS, *Professor of Mathematics and Statistics*, 1966.
B.S., Texas Tech, 1956; M.S., 1960; Ph.D., Texas (Austin), 1966.

ROGER L. LICHTI, *Assistant Professor of Physics*, 1979.
B.S., Ottawa (Kansas), 1967; M.S., Illinois, 1969; Ph.D., 1972.

ROBERT JOSEPH LIMA, *Assistant Professor of Architecture*, 1982.
B.Arch., Illinois Inst. of Technology, 1975; M.C.R.P., 1977.

JERALD G. LINDSEY, *Major, U.S.A., Assistant Professor of Military Science*, 1981.
B.S., Texas A&M, 1966.

ELIZABETH HALL LITTELL, *Associate Professor of Physical Therapy*, 1983.
B.A., Carleton, 1966; M.S., Case-Western Reserve, 1968; Ph.D., Baylor Coll. of Medicine, 1980.

LEONA MITCHELL LITTLE SOLDIER, *Professor of Education*, 1969.
B.S. in Ed., Northwestern, 1955; M.Ed., Texas Tech, 1964; Ed.D., Arizona, 1968.

BILLY J. LOCKE, *Professor of Psychology*, 1969.
B.A., Oklahoma, 1959; M.S., Oklahoma State, 1960; Ph.D., 1962; Lic. & Cert. Psychol. (Texas).

MARY LOU LOCKE, *Assistant Professor of History*, 1982.
B.A., Oberlin, 1970; M.A.T., Kent State, 1971; Ph.D., California (San Diego), 1982.

BILLY CLARENCE LOCKHART, *Professor of Art*, 1955.
B.S., West Texas State, 1950; M.Ed., Pennsylvania State, 1952; Ed.D., 1955.

MOHAMMAD ARFIN KHAN LODHI, *Professor of Physics*, 1963.
B.Sc., Hons. Karachi (Pakistan), 1952; M.Sc., 1956; D.I.C., Imperial Coll. (London, England), 1960; Ph.D., London, 1963.

MARTHA MORROW LOGAN, *Associate Professor of Family Management, Housing, and Consumer Science*, 1969.
B.S., Ohio State, 1940; M.S., 1965.

FABRIZIO LOMBARDI, *Assistant Professor of Electrical Engineering and Computer Science*, 1982.
B.Sc. in E.E., Essex (England), 1977; DIPL (UCL) in E.E., 1978; M.Sc. in E.E., U. Coll. London, 1978; Ph.D., London (England), 1982.

ROBERT A. LONG, *Professor of Animal Science*, 1976.
B.S., Ohio State, 1947; M.S., Oklahoma State, 1948; Ph.D., 1957.

GEORGE DEANE LOWE, II, *Professor of Sociology*, 1975.
B.A., Georgia, 1958; M.S., Pennsylvania State, 1961; Ph.D., Cornell, 1966.

HAROLD T. LUCE, *Professor and Chairperson, Department of Music*, 1973.
B.M., Jordan Coll. of Music, 1953; M.M., Florida State, 1956; Ph.D., 1958.

LAURA LOUISE LUCHSINGER, *Associate Professor of Business Administration*, 1954.
B.S.B.A., Arkansas, 1949; M.B.A., Texas Tech., 1955; D.B.A., 1968.

CHRISTOPHER JOHN LUPTON, *Lecturer and Assistant Chairperson, Department of Textile Engineering and Adjunct Professor of Clothing and Textiles*, 1974.
B.Sc., Leeds (England), 1970; Ph.D., 1973.

CYNTHIA EILEEN LYLE, *Assistant Professor of Management*, 1972.
B.A., Rice, 1964; M.A., Boston Coll., 1970.

RICHARD C. LYTLE, *Lecturer in Mass Communications and Director, Student Publications*, 1978.
A.B., Elizabethtown, 1963; M.A., Pennsylvania State, 1970.

MIKE J. MACIULA, *Lecturer in Petroleum Engineering*, 1980.
B.S. in I.E., Oklahoma A&M, 1948; Reg. Prof. Engr. (Oklahoma).

HORACE JURS MacKENZIE, *Professor of Industrial Engineering and Engineering Technology*, 1949.
B.S. in I.E., Texas Tech, 1948; M.S., Oklahoma State, 1953; Reg. Prof. Engr. (Texas).

BARRY A. MACY, *Associate Professor of Organizational Behavior*, 1979.
B.B.A., Ohio, 1966; M.B.A., 1968; Ph.D., Ohio State, 1975.

DOUGLAS PAT MADDOX, *Lecturer in Industrial Engineering*, 1981.
B.S., Texas A&M, 1965; M.S., 1966; Ph.D., Texas Tech. 1982.

CLEBORNE DAWSON MADDUX, *Associate Professor of Education*, 1981.
B.A., Arizona, 1966; M.A., Arizona State, 1971; Ph.D., Arizona, 1977.

JAMES E. MADDUX, *Assistant Professor of Psychology*, 1981.
B.A., Richmond, 1976; M.A., Alabama, 1979; Ph.D., 1982.

CHARLES H. MAHONE, *Professor of Psychology*, 1965.
B.A., Oklahoma, 1953; M.S., 1954; M.A., Michigan, 1955; Ph.D., 1959; Lic. Psychol. (Texas).

JOHN M. MALLOY, *Professor of Business Administration*, 1975.
B.B.A., Southern Methodist, 1961; M.B.A., 1966; Ph.D., Louisiana State, 1970; J.D., Salmon Chase School of Law, 1974; CPA, Member State Bar (Ohio).

ROBIN PAUL MALLOY, *Assistant Professor of Law*, 1983.
B.S., Purdue, 1977; J.D., Florida, 1980; LL.M., Illinois, 1983; Member State Bar (Florida).

MAX WAYLAND MANLEY, *Associate Professor of Education*, 1970.
B.S., West Texas State, 1959; M.Ed., Texas Tech, 1963; Ed.D., 1971.

HERSCHEL MANN, *Professor of Business Administration*, 1972.
B.B.A., Arkansas (Monticello), 1964; M.A., Alabama, 1966; Ph.D., 1971; CPA.

UZI MANN, *Associate Professor of Chemical Engineering*, 1978.
B.Sc., Technion-Israel Inst. of Technology, 1965; M.Sc., 1967; Ph.D., Wisconsin (Madison), 1972.

WILLIAM M. MARCY, *Associate Professor and Associate Dean, College of Engineering,* 1983.
B.S., Texas Tech, 1964; M.S., 1966; Ph.D., 1972.

ROBERT M. MARKLEY, *Assistant Professor of English,* 1981.
A.B., Vassar, 1974; M.A., Pennsylvania, 1976; Ph.D., 1980.

ROBERT MARLETT, *Associate Professor of Park Administration,* 1972.
B.S., Texas Tech, 1963; M.Ed., 1969; Ed.D., 1972.

ANNETTE W. MARPLE, *Associate Professor of Law,* 1973.
A.B., Rochester, 1949; M.A., Illinois, 1953; J.D., Texas Tech, 1973; Member State Bar (Texas).

HUGO DIXON MARPLE, *Professor of Music,* 1969.
B.A., West Liberty State, 1940; M.M., Michigan, 1946; Ph.D., Eastman School of Music, 1949.

JAMES L. MARRA, *Lecturer in Mass Communications,* 1978.
B.A., Moravian, 1965; M.A., William Paterson, 1978.

PHILIP HOWARD MARSHALL, *Associate Professor of Psychology,* 1971.
B.A., Rhode Island, 1967; M.A., 1970; Ph.D., Illinois, 1972.

CLYDE F. MARTIN, *Visiting Professor of Mathematics,* 1983.
B.S., Kansas State Teachers, 1965; M.A., Wyoming, 1967; Ph.D., 1971.

MICHAEL T. MARTIN, *Lecturer in Art,* 1980.
B.Arch., Texas Tech, 1973; Reg. Arch. (Texas).

ROBERT EDWARD MARTIN, *Associate Professor of Mechanical Engineering,* 1954.
B.S. in M.E., Texas Tech, 1949; M.S. in M.E., Wisconsin, 1952; Reg. Prof. Engr. (Texas).

JOHN NORBERT MARX, *Associate Professor of Chemistry,* 1967.
B.S., St. Benedict's, 1962; Ph.D., Kansas, 1965.

DANNY RAYMOND MASON, *Associate Professor of Health, Physical Education, and Recreation,* 1964.
B.S., Lamar State, 1961; M.Ed., Texas A&M, 1962; Ed.D., Arkansas, 1971.

ROBERT LOUIS MASON, *Professor of Engineering Technology,* 1942.
B.S. in M.E., Texas Tech, 1939; M.S., Kansas State, 1951; Reg. Prof. Engr. (Texas).

LARRY BRUCE MASTEN, *Professor and Chairperson, Department of Engineering Technology,* 1973.
B.S. in E.E., Texas Tech, 1961; M.S. in E.E., 1964; Ph.D., 1969.

ARTHUR G. MATCHES, *Professor of Plant and Soil Science and Holder of the Jesse and Dan Thornton Distinguished Chair in Plant and Soil Science,* 1981.
B.S., Oregon State, 1952; M.S., 1954; Ph.D., Purdue, 1960.

KARY MATHIS, *Professor and Chairperson, Department of Agricultural Economics,* 1982.
B.S., Texas Tech, 1958; M.S., Texas A&M, 1967; Ph.D., 1969.

JERRY BURNS MATTHEWS, *Associate Professor of Social Welfare,* 1971.
B.A., Texas Tech, 1961; M.S.W., Denver, 1966; A.C.S.W., 1968.

HENRY JAMES MAXWELL, *Professor of Romance Languages,* 1963.
B.A., Nebraska, 1940; M.A., Wisconsin, 1941; Ph.D., 1955.

RICHARD W. MAXWELL, *Associate Professor of Law,* 1975.
B.A., West Texas State, 1954; J.D., Texas Tech, 1970; Member State Bar (Texas).

LAWRENCE CLARK MAYER, *Professor of Political Science,* 1969.
A.B., Florida, 1958; M.A., California (Berkeley), 1963; Ph.D., Texas (Austin), 1969.

WILLIAM JAMES MAYER-OAKES, *Professor of Anthropology,* 1971.
M.A., Chicago, 1949; Ph.D., 1954.

JUDSON D. MAYNARD, *Professor of Music,* 1961.
B.M., Montana, 1951; M.M.E., 1953; Ph.D., Indiana, 1961; Final Diploma, Netherlands Carillon School, 1979; A.A.G.O.

MARY FLETCHER McBRIDE, *Associate Professor of English,* 1972.
B.A., Mississippi Coll., 1949; M.A., Mississippi, 1962; Ph.D., 1968.

DARRELL KEITH McCARTY, *Professor of Music,* 1953.
B.M.B.S., Illinois, 1950; M.M., 1951.

ROY L. McCASLAND, *Assistant Professor of Mathematics,* 1983.
B.S., Texas (Arlington), 1976; M.A., 1980; Ph.D., 1983.

THOMAS E. McCASLIN, *Assistant Professor of Accounting,* 1982.
B.B.A., Houston, 1969; M.Acc., Tennessee, 1981; D.B.A., 1982.

MEREDITH McCLAIN, *Associate Professor of German,* 1976.
B.Mus., Oberlin, 1964; M.A., Texas (Austin), 1970; Ph.D., 1976.

JACK E. McCROSKEY, *Professor and Chairperson, Department of Animal Science,* 1980.
B.S., Oklahoma State, 1953; M.S., 1959; Ph.D., 1961.

GORDON CARTWRIGHT McCUTCHAN, *Professor of Architecture,* 1962.
B.Arch., Texas A&M, 1943; M.Arch., Massachusetts Inst. of Technology, 1950; Reg. Arch. (Texas).

JAMES RICHARD McDONALD, *Professor of Civil Engineering,* 1958.
B.S., Texas Tech, 1958; M.S., Purdue, 1961; Ph.D., 1969; Reg. Prof. Engr. (Texas).

WALTER ROBERT McDONALD, *Professor of English,* 1971.
B.A., Texas Tech, 1956; M.A., 1957; Ph.D., Iowa, 1966.

DUNCAN EDWARD McDOWELL, *Instructor in English,* 1981.
B.A., Wheaton, 1969; M.A., Texas Tech, 1974.

PAUL EDWARD McGHEE, *Associate Professor of Home and Family Life,* 1978.
B.A., Oakland, 1963; M.A., Bucknell, 1965; Ph.D., Ohio State, 1968.

RICHARD PATRICK McGLYNN, *Associate Professor of Psychology,* 1969.
B.S., Loyola (Chicago), 1965; M.A., 1967; Ph.D., 1970.

RICHARD ALLEN McGOWAN, *Associate Professor of Music,* 1969.
B.Mus., Michigan, 1957; M.Mus., 1960; Ph.D., 1974.

VERNON RAY McGUIRE, *Associate Professor of Speech Communication,* 1965.
B.A., Wichita State, 1946; M.S., Kansas State, 1950.

RITA JEANNINE McHANEY, *Assistant Professor of Health, Physical Education, and Recreation,* 1966.
B.S., Arkansas State, 1965; M.S., 1966.

MARTIN HUGH McINTYRE, *Professor and Chairperson, Department of Health, Physical Education, and Recreation,* 1976.
B.S., Mankato State, 1951; M.S., Colorado, 1958; Ph.D., Iowa, 1963.

CORA F. McKOWN, *Professor of Family Management, Housing, and Consumer Science,* 1977.
B.S., Southeastern State, 1964; M.S., Oklahoma State, 1968; Ph.D., Missouri (Columbia), 1973.

ROBERT A. McLAUCHLAN, *Assistant Professor of Mechanical Engineering,* 1979.
B.S., Texas (Austin), 1964; Ph.D., 1978; Reg. Prof. Engr. (Texas).

THOMAS G. McLAUGHLIN, *Professor of Mathematics,* 1973.
A.B., California (Los Angeles), 1959; M.A., 1962; Ph.D., 1963.

SHIRLEY McMANIGAL, *Professor and Chairperson, Department of Medical Technology,* 1983.
M.T. (ASCP), Kansas City General Hospital, 1958; B.S., Arkansas State, 1971; M.S., Oklahoma Health Sciences Center, 1976; Ph.D., 1979.

BOBBIE L. McMICHAEL, *Adjunct Professor of Plant and Soil Science,* 1979.
B.S., Texas A&M, 1964; M.S., 1967; Ph.D., 1971.

JAMES FABER McNALLY, *Associate Professor of Health, Physical Education, and Recreation,* 1952.
B.S., Oklahoma, 1952; M.Ed., Texas Tech, 1957.

CLARA MUELLER McPHERSON, *Associate Professor of Food and Nutrition,* 1947.
B.S., Texas Tech, 1943; M.S., 1947; R.D.

CLINTON MARSUD McPHERSON, *Associate Professor of Chemistry,* 1956.
B.S.Ch.E., Texas Tech, 1947; M.Ed., 1953; Ed.D., 1959.

FREDA M. McVAY, *Assistant Professor of Mass Communications,* 1979.
B.A., Texas Tech, 1962; M.A., 1979.

JOHN STEPHEN MECHAM, *Professor of Biological Sciences,* 1965.
B.S., Texas (Austin), 1950; M.S., Florida, 1952; Ph.D., Texas (Austin), 1955.

C. RICHARD MEEK, *Associate Professor of Music,* 1965.
B.M., Oberlin, 1963; M.A., Eastman School of Music, 1970.

SHAMUS MEHAFFIE, *Professor and Associate Dean, College of Education,* 1971.
B.A., North Texas State, 1958; M.Ed., 1964; Ph.D., Texas (Austin), 1971.

STEVEN FREDERICK MEHLS, *Assistant Professor of History,* 1983.
B.A., Drake, 1974; M.A., Colorado, 1975; Ph.D., 1982.

KISHOR CHANDULAL MEHTA, *Professor of Civil Engineering,* 1964.
B.S., Michigan, 1957; M.S., 1958; Ph.D., Texas (Austin), 1965; Reg. Prof. Engr. (Texas).

R. D. MEHTA, *Lecturer in Textile Engineering,* 1969.
B.Sc., Gujarat (India), 1952; M.Sc., 1954; Ph.D., 1963; FTI (England).

E. ROLAND MENZEL, *Associate Professor of Physics,* 1979.
B.S., Washington State, 1967; Ph.D., 1970.

HOMER H. MERRIFIELD, *Professor and Chairperson, Department of Physical Therapy,* 1982.
A.B., Colgate, 1952; M.A., 1955; Ph.D., State U. of New York (Upstate), 1960; B.S., 1975.

JAMES D. MERTES, *Professor of Park Administration and Landscape Architecture,* 1970.
B.S., Michigan State, 1964; M.S., 1966; Ph.D., Texas A&M, 1970.

MICHAEL MEZACK III, *Associate Professor of Education and Director, Continuing Education,* 1975.
B.S., Lock Haven State, 1958; M.S., Bucknell, 1968; D.Ed., Pennsylvania State, 1974.

CHARLES GEORGE MICKEY, *Instructor in Biblical Literature,* 1975.
B.A., Abilene Christian, 1966; M.A., 1968.

JOHN DAVID MILLER, *Associate Professor of Mathematics,* 1968.
B.S., Eastern Illinois State, 1956; M.S., Iowa State, 1958; Ph.D., Indiana, 1963.

LELAND D. MILLER, *Professor of Occupational Therapy,* 1983.
B.A., Park Coll., 1952; Cert. OT, Washington U. School of Medicine, 1953; M.S., Bradley, 1956; Ed.D., Missouri, 1967.

RONALD MAX MILLER, *Associate Professor of Animal Science and Food Technology,* 1960.
B.S., Texas Tech, 1958; M.S., Michigan State, 1960; Ph.D., 1971.

JERRY LEE MILLS, *Professor of Chemistry,* 1970.
B.S., Texas (Austin), 1965; Ph.D., 1969.

JANET ROBERTA MINIFIE, *Assistant Professor of Business Administration,* 1982.
B.S., Bowling Green State, 1975; M.B.A., South Carolina, 1979; Ph.D., 1983.

JOSEPH EDWARD MINOR, *Professor of Civil Engineering,* 1969.
B.S., Texas A&M, 1959; M.Engr., 1960; Ph.D., Texas Tech, 1974; Reg. Prof. Engr. (Texas).

RAYMOND WILLIAM MIRES, *Professor of Physics,* 1957.
B.S., Texas Tech, 1955; M.S., 1960; Ph.D., Oklahoma, 1964.

ROBERT WETSEL MITCHELL, *Professor of Biological Sciences,* 1965.
B.S., Texas Tech, 1954; M.S., 1955; Ph.D., Texas (Austin), 1965.

ROY ERNEST MITCHELL, *Associate Professor of Chemistry,* 1966.
B.S., Texas A&M, 1958; Ph.D., Purdue, 1964.

ARUNKUMAR MITRA, *Associate Professor of Mathematics,* 1967.
B.S., St. Xavier's Coll., Calcutta U., 1955; M.S., 1957; Ph.D., Universitat Marburg (Germany), 1963.

GENE MITTLER, *Associate Professor of Art,* 1982.
B.S., Bowling Green State, 1957; M.F.A., 1963; Ph.D., Ohio State, 1971.

JOSEPH JOHN MOGAN, JR., *Professor of English and Linguistics,* 1966.
A.B., St. Mary's (Baltimore), 1945; S.T.B., 1948; M.A., Notre Dame, 1954; Ph.D., Louisiana State, 1961.

MARVIN LEE MOON, *Associate Professor of Art,* 1973.
B.A., West Texas State, 1955; M.A., New Mexico Highlands, 1969; Ph.D., Pennsylvania State, 1973.

DIANA MARIE MOORE, *Associate Professor of Health, Physical Education, and Recreation,* 1971.
B.A., Butler (Indianapolis), 1963; M.F.A., Southern Methodist, 1971.

STEVEN GARY WADE MOORE, *Instructor in Biblical Literature,* 1980.
B.S., McMurray, 1974; M.Div., Asbury Theological Seminary, 1980.

CHARLES THOMAS MOORES, *Assistant Professor of Business Administration,* 1982.
B.S., Arkansas (Little Rock), 1977; M.S., Louisiana State, 1978; Ph.D., 1982.

ROBERT A. MORELAND, *Associate Professor of Mathematics,* 1955.
B.S., Texas Tech, 1953; M.S., 1954; Ph.D., Texas (Austin), 1970.

**PHILIP RICHARD MOREY, *Professor of Biological Sciences,* 1970.
B.S., Dayton, 1962; M.S., Yale, 1964; Ph.D., 1967.

HARMON LOYD MORGAN, *Associate Professor of Mass Communications,* 1968.
B.J., Missouri, 1950; M.A., Oklahoma, 1963; Ph.D., Southern Illinois, 1974.

ROBERT J. MORRIS, *Professor of Romance Languages,* 1971.
A.B., North Carolina, 1962; M.A., 1966; Ph.D., Kentucky, 1968.

MARIETTA MORRISSEY, *Associate Professor of Sociology,* 1977.
B.A., Pittsburgh, 1970; M.A., Michigan State, 1973; Ph.D., 1977.

CARMYN H. MORROW, *Associate Professor of Clothing and Textiles and Associate Dean, College of Home Economics,* 1972.
B.S., Tuskegee Inst., 1948; M.S., Wisconsin, 1950; Ph.D., Pennsylvania State, 1968.

ELLEN RUTH MORROW, *Assistant Professor of Health, Physical Education, and Recreation,* 1967.
B.S., Southwest Texas State, 1958; M.A., Chico State, 1967; Ph.D., Texas Woman's, 1981.

JOHN TERRENCE MORROW, *Professor and Acting Chairperson, Department of Art,* 1968.
B.F.A., Texas (Austin), 1962; M.S., Indiana, 1967.

ELWYN WADE MORTON, *Assistant Professor of Mathematics,* 1955.
B.S., West Texas State, 1949; M.A., Texas (Austin), 1955.

R. CHARLES MOYER, *Professor of Business Administration and Area Coordinator, Finance,* 1980.
B.A., Howard, 1967; M.B.A., Pittsburgh, 1968; Ph.D., 1971.

JOANNA MROSS, *Assistant Professor of Architecture,* 1979.
B.Arch., Virginia Polytechnic Inst., 1970; M.Arch., 1971; M.F.A. Texas Tech, 1983.

JOHN R. MUMA, *Professor of Speech and Hearing Sciences,* 1978.
B.S., Central Michigan, 1960; M.A., 1963; Ph.D., Pennsylvania State, 1967.

RICHARD HOWARD MUNSON, *Assistant Professor of Horticulture,* 1981.
B.S., Ohio State, 1971; M.S., Cornell, 1973; Ph.D., 1981.

PAUL HARRY MUNTER, *Associate Professor of Business Administration,* 1978.
B.S., California State (Fresno), 1974; M.S., 1975; D.B.A., Colorado, 1978; CPA.

BRIAN R. MURPHY, *Assistant Professor of Wildlife Sciences,* 1980.
B.S., Detroit, 1975; M.S., Purdue, 1977; Ph.D., Virginia Polytechnic Inst. and State U., 1981.

GROVER ELMER MURRAY, *University Professor (Geoscience; Preventive Medicine and Community Health),* 1966.
B.S., North Carolina, 1937; M.S., Louisiana State, 1939; Ph.D., 1942.

JAMES GLENN (KEN) MURRAY, *Instructor in Health, Physical Education, and Recreation,* 1978.
B.S., Texas (Austin), 1968; M.A., East Tennessee State, 1969.

JOHN JOSEPH MURRAY, *Associate Professor of Electrical Engineering,* 1978.
B.Sc., National U. of Ireland, 1969; M. Sc., 1970; Ph.D., Notre Dame, 1974.

JOHN S. MURRAY, *Associate Professor of Law,* 1982.
B.A., Cornell, 1961; M.A., Columbia, 1962; J.D., Iowa, 1968; Member State Bar (Iowa and New York).

CHARLES W. MYLES, *Associate Professor of Physics,* 1978.
B.S., Missouri (Rolla), 1969; M.S., Washington (St. Louis), 1971; Ph.D., 1973.

MARGARET C. NAGY, *Assistant Professor of Art,* 1983.
B. Environ. Des., Texas A&M, 1975; M.F.A., Texas Tech, 1979.

KAZUO NAKAJIMA, *Assistant Professor of Computer Science,* 1980.
B.Eng., Osaka (Japan), 1973; M.Eng., 1975; Ph.D., Northwestern, 1980.

DANIEL O. NATHAN, *Associate Professor and Chairperson, Department of Philosophy,* 1973.
A.B., Michigan, 1969; M.A., Illinois (Chicago), 1970; Ph.D., 1977.

JAMES WILLIAM NEILL, *Assistant Professor of Mathematics and Statistics,* 1982.
B.S., Eastern Illinois, 1971; M.S., Missouri (Rolla), 1973; Ph.D., Kansas State, 1982.

HAROLD G. NELSON, *Assistant Professor of Architecture,* 1982.
B.Arch., Montana State, 1970; M.Arch., California (Berkeley), 1975; Ph.D., 1979.

OTTO MILLARD NELSON, *Associate Professor of History and Associate Dean, College of Arts and Sciences,* 1965.
B.S., Oregon, 1956; M.A., 1961; Ph.D., Ohio State, 1968.

PAUL NELSON, JR., *Professor of Mathematics,* 1972.
B.S., Auburn, 1958; M.S., New Mexico, 1962; Ph.D., 1969.

BENY NETA, *Assistant Professor of Mathematics,* 1980.
B.S., Tel-Aviv (Israel), 1967; M.S., 1971; Ph.D., Carnegie-Mellon, 1977.

JOHN NEVIUS, *Professor of Education,* 1974.
B.A., George Pepperdine Coll., 1951; M.S., Southern California, 1955; Ph.D., 1972.

BENJAMIN HAVELOCK NEWCOMB, *Associate Professor of History,* 1964.
B.A., Haverford, 1960; M.A., Pennsylvania, 1961; Ph.D., 1964.

FORREST A. NEWLIN, *Associate Professor of Theatre Arts,* 1980.
B.A., Emporia State, 1960; B.S.E., 1960; M.S., 1965; Ph.D., Nebraska, 1978.

THOMAS G. NEWMAN, *Professor of Mathematics,* 1967.
B.A., Howard Payne, 1962; M.A., Texas (Austin), 1964; Ph.D., 1967.

DŨNG X. NGUYỄN, *Assistant Professor of Mathematics,* 1981.
B.S., Texas Tech, 1975; M.A., California (Berkeley), 1979; Ph.D., 1981.

WILLIAM W. NICHOLLS, JR., *Assistant Professor of Political Science,* 1979.
A.B., Georgia State, 1970; M.A., 1975; Ph.D., Kentucky, 1980.

DORINDA JANE NALL NOBLE, *Associate Professor of Social Welfare,* 1974.
B.A., Texas Tech, 1969; M.S.W., Tulane, 1972.

**MARK R. NORMAN, *Lecturer in Mass Communications and Director, KTXT-FM,* 1978.
B.A., Northwestern Oklahoma State, 1973; M.S., Oklahoma State, 1975.

DAVID KNIGHT NORTHINGTON III, *Associate Professor of Biological Sciences and Director, Junction Center,* 1971.
B.A., Texas (Austin), 1967; Ph.D., 1971.

H. SCOTT NORVILLE, *Assistant Professor of Civil Engineering,* 1981.
B.S., Toledo, 1974; M.S., 1976; Ph.D., Purdue, 1981.

HARLEY DEAN OBERHELMAN, *Professor of Romance Languages,* 1958.
B.S., Kansas, 1950; M.A., 1952; Ph.D., 1958.

STEVEN M. OBERHELMAN, *Assistant Professor of Romance Languages,* 1983.
B.S., Minnesota, 1974; M.A., 1976; Ph.D., 1981.

WILLIAM EUGENE ODEN, *Professor of Political Science,* 1948.
B.A., Oklahoma, 1946; M.A., 1949; Ph.D., Indiana, 1957.

EDGAR A. O'HAIR, *Associate Professor of Electrical Engineering,* 1982.
B.S., United States Military Academy, 1953; M.S., Purdue, 1960; D.M.E., Columbia, 1963; Ph.D., Purdue, 1977.

JAMES W. OLER, *Assistant Professor of Mechanical Engineering,* 1980.
B.S., Texas (Austin), 1974; M.S., 1976; Ph.D., Purdue, 1980.

CLIFFORD C. OLSEN, *Associate Professor of Speech and Hearing Sciences,* 1980.
B.A., San Jose State, 1972; M.A., Kansas, 1974; Ph.D., 1976.

JIMMIE LEIF OLSON, *Lecturer in Petroleum Engineering,* 1983.
B.S., Texas Tech, 1952.

ARTHUR B. ONKEN, *Adjunct Professor of Plant and Soil Science,* 1982.
B.S., Texas A&I, 1959; M.S., Oklahoma State, 1963; Ph.D., 1964.

CALVIN C. ORR, *Adjunct Professor of Entomology,* 1979.
B.S., Kansas State, 1950; Ph.D., 1964.

DONALD EUGENE ORR, JR., *Associate Professor of Animal Science,* 1975.
B.S., Purdue, 1967; M.S., Pennsylvania State, 1969; Ph.D., Michigan State, 1975.

MARY SEYMOUR OWENS, *Professor of Health, Physical Education, and Recreation,* 1966.
B.A., State U. of New York (Albany), 1946; M.A., Syracuse, 1951; Ph.D., Arizona State, 1970.

THOMAS RICHARD OWENS, *Associate Professor of Agricultural Economics,* 1965.
B.S., Pennsylvania State, 1948; M.S., 1956; Ph.D., Oregon State, 1962; J.D., Texas Tech, 1977.

CHESTER JOSEPH PACH, JR., *Assistant Professor of History,* 1982.
A.B., Brown, 1971; M.A., Northwestern, 1975; Ph.D., 1981.

C. EDDIE PALMER, *Associate Professor of Sociology,* 1975.
B.A., Mississippi State, 1967; M.A., 1969; Ph.D., Virginia Polytechnic Inst. and State U., 1975.

HARRY WILLIAM PARKER, *Professor of Chemical Engineering,* 1970.
B.S. in Ch.E., Texas Tech, 1953; M.S. in Ch.E., Northwestern, 1954; Ph.D., 1956; Reg. Prof. Engr. (Texas and Oklahoma).

JAMES S. PARKER, *Chairperson, Department of Textile Engineering,* 1973.
B.S., North Carolina State, 1950.

GERALD PARR, *Associate Professor of Education,* 1974.
B.S., Nebraska, 1965; M.A., Colorado, 1971; Ph.D., 1974.

WILLIAM TAYLOR PATTERSON, *Professor of Romance Languages and Linguistics,* 1961.
B.A., Kansas, 1954; M.Ed., Pennsylvania State, 1961; Ph.D., Stanford, 1967.

STEVEN PAXTON, *Assistant Professor of Music,* 1981.
B.M., North Texas State, 1973; M.M., 1977; Ph.D., Texas Tech, 1981.

DAVID PAYNE, *Associate Professor of Music,* 1967.
Mus.B., Oberlin, 1965; M.M.Ed., Texas Tech, 1969.

EUGENE E. PAYNE, *Adjunct Associate Professor of Business Administration and Vice President for Finance and Administration,* 1981.
B.S., Texas A&M, 1964; M.S., 1965; Ph.D., Oklahoma, 1970.

EARLENE TASH PAYNTER, *Associate Professor and Chairperson, Department of Speech and Hearing Sciences,* 1970.
B.A., Our Lady of the Lake, 1964; M.A., 1966; Ph.D., Kansas, 1970.

LAURENCE N. PEAKE, *Professor and Chairperson, Department of Occupational Therapy,* 1982.
B.S., Virginia Commonwealth, 1954; M.S., Pennsylvania, 1962; Ph.D., Southeastern, 1978.

KENT PEARCE, *Assistant Professor of Mathematics,* 1980.
B.S., Brigham Young, 1972; M.S., 1975; Ph.D., State U. of New York (Albany), 1980.

NEALE J. PEARSON, *Professor of Political Science,* 1969.
B.A., Maryville, 1952; B.S., Georgetown, 1956; M.S., 1964; Ph.D., Florida, 1967.

RONALD JAMES PEDERSON, *Assistant Professor of Mechanical Engineering,* 1977.
B.S., South Dakota State, 1967; M.S., Arizona, 1969; Ph.D., Minnesota, 1976; Reg. Prof. Engr. (Texas).

CHARLES W. PEEK, *Professor of Sociology,* 1975.
A.B., Georgia, 1960; M.A., 1963; Ph.D., Duke, 1971.

DANNY B. PENCE, *Adjunct Profesor of Range and Wildlife Management,* 1983.
Ph.D., Louisiana State.

GEORGE T. C. PENG, *Professor of Architecture,* 1975.
B.Arch., Sun Yet-sen U. (China), 1951; M.Arch., Illinois, 1954; Dr.-Ing., Technische Hochschule Aachen (Germany), 1961; Planner AICP (Nebraska, Iowa, Kansas, Georgia, West Virginia, and Florida).

JANET W. PEREZ, *Professor of Romance Languages,* 1977.
B.A., Missouri (Kansas City), 1955; M.A., Duke, 1957; Ph.D., 1961.

VERNON J. PEREZ, *Professor of Psychology,* 1975.
B.S., Tulane, 1957; M.S., 1960; Ph.D., Washington (St. Louis), 1964.

JERRY PERKINS, *Associate Professor of Political Science,* 1979.
B.A., Texas Tech, 1965; M.A., 1967; Ph.D., Emory, 1972.

KAREN L. PERKINS, *Instructor in Food and Nutrition,* 1979.
B.S., Kansas State, 1975; M.S., 1978.

ROBERT D. PERL, *Assistant Professor of Architecture,* 1979.
B.Arch., Cincinnati, 1976; M.Arch., California (Berkeley), 1979; Reg. Arch. (Texas).

MICHAEL PETERS, *Assistant Professor in Architecture,* 1979.
B.Arch., Arizona, 1968; M.Arch., Harvard, 1971; Reg. Arch. (Massachusetts, Texas).

ARLIN V. PETERSON, *Associate Professor of Education,* 1972.
B.S., Minot State Coll., 1962; M.A., Northern Arizona, 1965; Ed.D., Washington State, 1970.

RICHARD EMIL PETERSON, *Professor of Atmospheric Science,* 1973.
B.S., California Inst. of Technology, 1963; M.S., Chicago, 1964; Ph.D., Missouri, 1971.

RICHARD L. PETERSON, *Professor of Finance and Holder of the I. Wylie and Elizabeth Briscoe Chair in Bank Management,* 1982.
B.S., Iowa State, 1962; M.A., Michigan, 1965; Ph.D., 1966.

RUSSELL DEAN PETTIT, *Associate Professor of Range Management,* 1969.
B.S., Fort Hays Kansas State, 1963; M.S., Texas Tech, 1965; Ph.D., Oregon State, 1968.

MARILYN E. PHELAN, *Professor of Law and General Counsel,* 1974.
B.A., Texas Tech, 1959; M.B.A., 1967; D.B.A., 1971; J.D., Texas (Austin), 1972; CPA; Member State Bar (Texas).

GEORGE REX PHILBRICK, *Professor of Health, Physical Education, and Recreation,* 1947.
B.S., Texas Tech, 1939; M.Ed. in P.E., Texas (Austin), 1950.

FLORENCE L. PHILLIPS, *Professor of Psychology,* 1954.
B.A., Marshall, 1944; M.A., Michigan State, 1946; Ed.D., Indiana, 1958.

LAWRENCE C. PHILLIPS, *Professor of Business Administration and Holder of the Frank M. Burke Chair in Taxation,* 1983.
B.B.A., Case Western Reserve, 1960; M.B.A., 1963; Ph.D., Ohio State, 1966; CPA.

SHERMAN A. PHILLIPS, JR., *Assistant Professor of Entomology,* 1982.
B.S., Northeast Louisiana, 1971; M.S., 1973; Ph.D., Texas A&M, 1979.

ROBERT HENRY PINDER, *Associate Professor of Home and Family Life,* 1971.
B.A., Stetson, 1950; B.D., Southern Baptist Theological Seminary, 1953; Th.M., 1954; Ph.D., Florida State, 1971.

MARVIN R. PLATTEN, *Associate Professor of Education,* 1971.
B.S., Minnesota, 1952; M.Ed., 1956; Ph.D., Texas Tech, 1976.

HERMAN H. PLOTT, *Assistant Professor of Engineering Technology,* 1981.
B.S., Auburn, 1961; M.S., 1965; Ph.D. in E.E., 1972.

GARY C. POFFENBARGER, *Assistant Professor of English,* 1980.
B.A., Oklahoma State, 1972; M.A., 1975.

JERI POOL, *Part-time Lecturer in Clothing and Textiles,* 1982.
B.S., Texas Woman's, 1958.

WILLIAM MANOS PORTNOY, *Professor of Electrical Engineering,* 1967.
B.S., Illinois, 1952; M.S., 1952; Ph.D., 1959.

CHARLES WILLIAM POST, *Professor of Music,* 1957.
B.M., Colorado State, 1942; B.S., 1947; M.A., Denver, 1960.

LOUIS JOHN POWERS, *Professor of Mechanical Engineering,* 1942.
B.S. in M.E., Texas Tech, 1939; M.S., Texas (Austin), 1950; Reg. Prof. Engr. (Texas).

ARTHUR ALBERT PREISINGER, *Instructor in Biblical Literature,* 1967.
B.A., Concordia, 1955; M.Div., 1958; M.A., Oklahoma, 1967.

RODNEY LEROY PRESTON, *Professor of Animal Science and Holder of the Jesse and Dan Thornton Distinguished Chair in Animal Science,* 1982.
B.S., Colorado State, 1953; M.S., Iowa State, 1955; Ph.D., 1957.

JOHN B. PRICE, *Lecturer in Textile Engineering,* 1981.
B.Sc. (Hons), Manchester (England), 1969; ATI (England).

ROBERT V. PRICE, *Assistant Professor of Education,* 1982.
B.S., East Texas State, 1967; M.Ed., 1969; Ph.D., Texas (Austin), 1975.

DONALD W. PRINCE, *Instructor and Chairperson, Department of Biblical Literature,* 1981.
B.A., North Texas State, 1973; M.Div., Southwestern Baptist Theological Seminary, 1977.

VERNON WILLARD PROCTOR, *Professor of Biological Sciences,* 1956.
A.B., Missouri, 1950; A.M., 1951; Ph.D., 1955.

DENNIS EDWARD PRUSS, *Instructor in Health, Physical Education, and Recreation,* 1982.
B.S., Utah State, 1977; M.S., Arizona, 1978.

RAY A. PURKERSON, *Associate Professor of Education,* 1972.
B.S., Lamar, 1954; M.A., Houston, 1962; Ed.D., 1972.

CHARLES RICHARD QUADE, *Professor of Physics*, 1965.
B.S., Oklahoma, 1958; M.S., 1960; Ph.D., 1962.

JOHN WILLIAM QUEEN, *Associate Professor of Art*, 1960.
B.S., Houston, 1956; M.F.A., Kansas, 1962.

W. REED QUILLIAM, JR., *Professor of Law*, 1969.
B.A., Texas (Austin), 1949; B.B.A., 1951; J.D., 1953; LL.M., Harvard, 1969; Member State Bar (Texas).

WILLIAM H. QUINN, *Assistant Professor of Home and Family Life*, 1980.
B.A., State U. of New York (Oswego), 1970; M.S., Oregon, 1974; Ph.D., Virginia Polytechnic Inst. and State U., 1980.

JERRY E. QUISENBERRY, *Adjunct Professor of Plant and Soil Science*, 1981.
B.S., Texas A&M, 1965; M.S., 1969; Ph.D., 1970.

JENIFER R. RAGLE, *Lecturer in Textile Engineering*, 1982.
B.S., Texas Tech, 1982.

CHARLES A. RAINEY, *Assistant Professor of Mass Communications*, 1982.
B.G.E., Nebraska (Omaha), 1965; M.S., San Diego State, 1976; Ph.D., United States International, 1982.

CLOVIS BOYD RAMSEY, *Professor of Animal Science and Food Technology*, 1968.
B.S., Tennessee, 1956; M.S., Kentucky, 1957; Ph.D., 1960.

JERRY DWAIN RAMSEY, *Professor of Industrial Engineering and Biomedical Engineering and Computer Medicine; also Associate Vice President for Academic Affairs*, 1965.
B.S., Texas A&M, 1955; M.S., 1960; Ph.D., Texas Tech, 1967; Reg. Prof. Engr. (New Mexico).

RALPH HEYWARD RAMSEY, III, *Associate Professor of Civil Engineering*, 1974.
B.S., Clemson, 1957; M.S., 1965; Ph.D., Oklahoma, 1970; Reg. Prof. Engr. (Texas).

PAUL H. RANDOLPH, *Professor of Business Administration*, 1981.
B.S., Minnesota, 1948; M.S., 1949; Ph.D., 1955.

JOSEPH M. RANSDELL, *Associate Professor of Philosophy*, 1974.
B.A., San Francisco State, 1961; Ph.D., Columbia, 1966.

THOMAS ARTHUR RATCLIFFE, *Associate Professor of Business Administration*, 1977.
B.S., Troy State, 1974; M.A., Alabama, 1976; Ph.D., 1977.

JOSEPH BLAND BOB RAY, *Professor of Psychology*, 1963.
B.A., Oklahoma, 1948; M.S., 1949; Ph.D., 1954; Lic. Psychol. (Texas).

CHARLES A. REAVIS, *Professor of Education*, 1977.
A.B., North Carolina (Chapel Hill), 1959; M.Ed., 1961; Ed.D., Duke, 1966.

IRVIN THOMAS REDCAY, *Professor of Music*, 1966.
B.M., Eastman School of Music, 1951; M.M., 1958; D.M.A., 1962.

MARGARET WEEKS REDCAY, *Lecturer in Music*, 1967.
B.Mus., Eastman School of Music, 1957.

RICHARD EDWARD REDINGER, *Assistant Professor of Music*, 1977.
B.M., Wayland Baptist, 1970; M.M., Baylor, 1974.

**RICHARD LEE REDINGTON, *Professor of Chemistry*, 1967.
B.A., Minnesota, 1955; Ph.D., Washington, 1961.

NANCY B. REED, *Associate Professor of Art*, 1975.
B.A., California (Santa Barbara), 1966; M.A., Missouri (Columbia), 1968; Ph.D., 1973.

ROBERT RENTOUL REED, *Assistant Professor of Horticulture*, 1957.
B.S., Pennsylvania State, 1954.

C. C. REEVES, JR., *Professor of Geosciences*, 1957.
B.S., Oklahoma, 1955; M.S., 1957; Ph.D., Texas Tech, 1970; Cert. Prof. Geol.

JOHN DOUGLAS REICHERT, *Professor of Electrical Engineering*, 1971.
B.S., Texas (Austin), 1961; B.A., 1961; Ph.D., California Inst. of Technology, 1965.

MARYANNE REID, *Associate Professor of Education*, 1966.
B.S., Northwestern, 1952; M.A., California (Los Angeles), 1955; Ed.D., Texas Tech, 1967.

JACQUELINE S. REINIER, *Assistant Professor of History*, 1979.
B.A., Virginia, 1959; M.A., California (Berkeley), 1969; Ph.D., 1977.

LEVERN ANTHONY REIS, *Associate Professor of Mechanical Engineering,* 1957.
B.S. in M.E., Texas Tech, 1960; M.Met.E., Oklahoma, 1962; Reg. Prof. Engr. (Texas).

ROBERT GEORGE REKERS, *Associate Professor of Chemistry,* 1955.
B.S., Rochester, 1942; Ph.D., Colorado, 1951.

ELBERT BRUNNER REYNOLDS, JR., *Associate Professor of Engineering Technology and Mechanical Engineering,* 1964.
B.S. in M.E., Texas A&M, 1947; M.S. in M.E., Pennsylvania State, 1948; Ph.D. in M.E., Wisconsin, 1957; Reg. Prof. Engr. (Texas).

HOWARD LEE REYNOLDS, *Assistant Professor of Engineering Technology,* 1982.
B.S. in I.E., Arizona State, 1967; M.S. in I.E., 1968.

PATRICIA K. REYNOLDS, *Instructor in English,* 1981.
B.A., Eastern New Mexico, 1974; M.A., Texas Tech, 1976.

MARY LYNNE RICHARDS, *Assistant Professor of Clothing and Textiles,* 1979.
B.S., Michigan State, 1970; M.A., 1975; Ph.D., Maryland, 1978.

C. REED RICHARDSON, *Associate Professor of Animal Science,* 1976.
B.S., Kentucky, 1971; M.S., 1973; Ph.D., Illinois, 1976.

CHARLES LATHAN RIGGS, *Professor of Mathematics,* 1953.
B.A., Texas Christian, 1944; M.A., Michigan, 1945; Ph.D., Kentucky, 1949.

JAMES B. RIGGS, *Associate Professor of Chemical Engineering,* 1983.
B.S., Texas (Austin), 1969; M.S., 1972; Ph.D., California (Berkeley), 1977.

MARY TOM RILEY, *Professor of Home and Family Life,* 1972.
B.A., Coll. of the Ozarks, 1954; M.B.A., West Texas State, 1959; Ed.D., Texas Tech, 1974.

ROBERT J. RITCHEY, *Assistant Professor of Finance,* 1982.
B.S., Pennsylvania State, 1970; M.B.A., Arizona, 1976; Ph.D., 1981.

CAROL ROBACKER, *Assistant Professor of Plant Breeding,* 1981.
B.S., Pennsylvania State, 1975; M.S., Minnesota, 1977; Ph.D., 1981.

ALDEN E. ROBERTS, *Assistant Professor of Sociology,* 1981.
B.S., Moorhead State, 1968; M.A., State U. of New York (Binghamton), 1970; Ph.D., Washington, 1975.

DAYTON YOUNG ROBERTS, *Professor and Area Coordinator, Higher Education,* 1973.
B.A., Florida State, 1958; M.A., 1959; Ph.D., 1964.

LARRY SPURGEON ROBERTS, *Professor and Chairperson, Department of Biological Sciences,* 1979.
B.S., Southern Methodist, 1956; M.S., Illinois, 1958; Sc.D., Johns Hopkins, 1961.

GEORGE WILSE ROBINSON, *Professor of Chemistry and Holder of the Robert A. Welch Chair in Chemistry,* 1976.
B.S., Georgia Inst. of Technology, 1948; M.S., 1949; Ph.D., State U. of Iowa, 1952.

WILLARD BETHUREM ROBINSON, *Professor of Architecture,* 1963.
B.Arch., Montana State, 1958; M.Arch., Rice, 1960; Reg. Arch. (Montana and Texas).

JON E. RODIEK, *Professor and Chairperson, Department of Park Administration and Landscape Architecture,* 1983.
B.S., Rutgers, 1967; B.L.A., Massachusetts, 1967; M.L.A., 1968; M.S., 1973; Ph.D., 1974.

RUTH MARIE ROGERS, *Professor of Health, Physical Education, and Recreation,* 1971.
B.A., Colorado, 1949; M. of H.P.E.R., North Texas State, 1952; Ph.D., Texas Woman's, 1970.

NINA LORRAINE RONSHAUSEN, *Associate Professor of Education,* 1975.
B.S.Ed., Kent State, 1963; M.S., Miami, 1969; D.Ed., Indiana, 1971.

ROBERT ALAN ROOKER, *Associate Professor of Mass Communications,* 1963.
B.A., Texas Tech, 1958; M.A., 1960.

GENE EDWARD ROOZE, *Professor of Education,* 1969.
B.S., Purdue, 1960; M.A., Northwestern, 1965; Ph.D., Southern Illinois, 1968.

BRENT STEINBECK ROPER, *Associate Professor of Sociology,* 1971.
B.A., Idaho State, 1966; M.A., Arizona State, 1969; Ph.D., Washington State, 1972.

FRANCIS L. ROSE, *Professor of Biological Sciences,* 1966.
B.S., Georgia, 1960; M.S., 1962; Ph.D., Tulane, 1965.

DARRELL T. ROSENOW, *Adjunct Professor of Plant and Soil Science*, 1980.
B.S., Kansas State, 1958; M.S., 1960; Ph.D., Texas A&M, 1970.

BILLY IRVAN ROSS, *Professor and Chairperson, Department of Mass Communications*, 1970.
B.S., Missouri, 1948; M.A., Eastern New Mexico, 1952; Ph.D., Southern Illinois, 1964.

PATSIE ELIZABETH ROSS, *Instructor in Health, Physical Education, and Recreation*, 1970.
B.S. in Ed., Texas Tech, 1953; M.Ed., 1969.

RICHARD J. ROSS, *Captain, U.S.A., Assistant Professor of Military Science*, 1981.
B.S., Texas A&M, 1973.

ROBERT LYLE ROUSE, *Professor of Economics and Business Administration*, 1950.
B.A., Coe Coll., 1943; M.A., Iowa, 1949; Ph.D., 1950.

SUJIT KUMAR ROY, *Professor of Agricultural Economics*, 1968.
B.A., Visva Bharati (India), 1958; M.A., 1960; M.S.A., Toronto, 1964; Ph.D., Pennsylvania State, 1969.

CAROLYN D. RUDE, *Assistant Professor of English*, 1981.
A.B., Grove City Coll., 1967; A.M., Illinois, 1969; Ph.D., 1975.

DONALD W. RUDE, *Professor of English*, 1971.
B.A., Wichita State, 1959; M.A., 1961; Ph.D., Illinois, 1971.

DON R. RUMMEL, *Adjunct Professor of Entomology*, 1981.
B.S., Texas A&M, 1960; M.S., 1964; Ph.D., 1970.

JEFFREY C. RUPP, *Assistant Professor of Health, Physical Education, and Recreation*, 1982.
B.S., Slippery Rock State, 1977; M.A., Ohio State, 1981; Ph.D., 1982.

JAMES ARTHUR RUSHING, *Assistant Professor of English*, 1952.
B.S., Southern Methodist, 1949; M.A., 1951.

ELIZABETH ANNE RYLANDER, *Instructor in English*, 1973.
B.A., Texas Christian, 1965; M.A., Texas Tech, 1969.

MICHAEL KENT RYLANDER, *Professor of Biological Sciences*, 1965.
B.A., North Texas State, 1956; M.S., 1962; Ph.D., Tulane, 1965.

JOHN WILLIAM SAMSON, *Assistant Professor of English*, 1982.
B.S., Bemidji State, 1975; M.A., Cornell, 1978; Ph.D., 1980.

BILLY JOE SANDLIN, *Associate Professor of Physics*, 1955.
B.S., East Texas State, 1948; M.S., 1949; Ph.D., Texas (Austin), 1960.

ALBERT JOSEPH SANGER, *Professor of Engineering Technology*, 1956.
B.S., Cincinnati, 1942; M.S., Illinois Inst. of Technology, 1948; Reg. Prof. Engr. (Texas).

ELIZABETH SKIDMORE SASSER, *Professor of Architecture*, 1949.
B.F.A., Ohio State, 1943; M.A., 1944; Ph.D., 1946.

GRANT T. SAVAGE, *Assistant Professor of Managerial Communication*, 1983.
B.A., Connecticut, 1977; M.A., Ohio State, 1979; Ph.D., 1983.

STEPHEN M. SCARIANO, *Assistant Professor of Mathematics and Statistics*, 1983.
B.S., Loyola, 1977; M.S., Texas Tech, 1981; Ph.D., 1983.

GERHARD SCHAEFER, *Associate Professor of Electrical Engineering*, 1981.
M.S., Technical U. of Berlin (Germany), 1969; Ph.D., 1973.

ROGER CARL SCHAEFER, *Associate Professor of Political Science*, 1976.
B.A., Wisconsin (Eau Claire), 1967; M.A., Minnesota, 1970; Ph.D., 1974.

RODRIC BRUCE SCHOEN, *Professor of Law*, 1971.
B.A., Colorado (Boulder), 1956; J.D., New Mexico, 1966; Member State Bar (New Mexico and Texas).

KARL H. SCHOENBACH, *Associate Professor of Electrical Engineering*, 1980.
M.S. in Physics, Technische Hochschule Darmstadt, 1966; Ph.D., 1970.

MICHAEL K. SCHOENECKE, *Assistant Professor of English*, 1981.
B.A., Central State, 1971; M.A., 1974; Ph.D., Oklahoma State, 1979.

SUSAN SCHOENFELD, *Assistant Professor of Music*, 1977.
B.M., Mannes Coll. of Music, 1969; M.M., Texas Tech, 1982.

*LAWRENCE E. SCHOVANEC, *Assistant Professor of Mathematics*, 1982.
B.S., Phillips, 1975; M.S., Texas A&M, 1977; Ph.D., Indiana, 1982.

JANET M. SCHROCK, *Assistant Professor of Family Management, Housing, and Consumer Science*, 1978.
B.S., Indiana U. of Pennsylvania, 1964; M.Ed., Pennsylvania State, 1971; M.S., Oklahoma State, 1974; Ph.D., Missouri (Columbia), 1978.

JAY R. SCHROCK, *Part-time Instructor in Food and Nutrition*, 1979.
B.S., Oklahoma State, 1973; M.S., Kansas State, 1976.

JEAN PEARSON SCOTT, *Assistant Professor of Home and Family Life*, 1979.
B.S.H.E., North Carolina (Greensboro), 1973; M.S., 1975; Ph.D., 1979.

WILLIAM LON SCOTT, *Associate Professor of Finance*, 1981.
B.B.A., North Texas State, 1964; M.A., Austin Coll., 1966; Ph.D., Houston, 1971.

RUSSELL HOLLAND SEACAT, JR., *Professor of Electrical Engineering*, 1959.
B.S.E.E., Texas A&M, 1948; M.S.E.E., 1958; Ph.D., 1963; Reg. Prof. Engr. (Nevada and Texas).

HERMAN BRAZILL SEGREST, *Professor of Health, Physical Education, and Recreation*, 1963.
B.S., North Texas State, 1937; M.S., 1946; M.Ed., Texas A&M, 1955; Ed.D., Baylor, 1962.

CHERYL A. SEGRIST, *Assistant Professor of Management*, 1981.
B.A., Ohio State, 1969; Ph.D., North Carolina, 1980.

KAL HILL SEGRIST, JR., *Assistant Professor of Health, Physical Education, and Recreation*, 1964.
B.S., North Texas State, 1962; M.Ed., Texas Tech, 1965.

FAROUK YOUSSEF SEIF, *Lecturer in Architecture*, 1982.
B.Arch., Helwan (Egypt), 1977; M.Arch., Kent State, 1981; Intern Arch. (Texas).

FORTUNATO FRED SENATORE, *Assistant Professor of Chemical Engineering*, 1983.
B.A., Columbia, 1975; M.S., 1977; Ph.D., Rutgers, 1983.

JOHN THOMAS SENNETTI, *Associate Professor of Business Administration*, 1971.
B.A., Scranton, 1966; M.A., Bucknell, 1968; M.Stat., Florida, 1969; Ph.D., Virginia Polytechnic Inst. and State U., 1973.

LINDA M. SHARP, *Lecturer in Management*, 1979.
B.S.E., Arkansas, 1972; M.A., 1974.

PATRICK W. SHAW, *Associate Professor of English*, 1972.
B.A., Austin Coll., 1962; M.A., North Texas State, 1965; Ph.D., Louisiana State, 1971.

ROBERT W. SHAW, *Assistant Professor of Chemistry*, 1981.
B.A., West Virginia, 1971; Ph.D., Pennsylvania State, 1976.

KYUNG WOOK SHIN, *Associate Professor of Music*, 1973.
B.M., Seoul National U. (Korea), 1961; M.S. in Music, Indiana (Bloomington), 1972.

HENRY JOSEPH SHINE, *Horn Professor of Chemistry*, 1954.
B.Sc., London (England), 1944; Ph.D., 1947.

CHARLES BRADLEY SHRADER, *Assistant Professor of Business Administration*, 1983.
B.S., Brigham Young, 1976; M.P.A., 1978; M.B.A., Indiana, 1981.

JOANN SHROYER, *Instructor in Family Management, Housing, and Consumer Science*, 1980.
B.S., Texas Tech, 1977; M.S., 1980.

DESKIN HUNT SHURBET, JR., *Professor of Geosciences*, 1956.
B.S., Texas (Austin), 1950; M.A., 1951.

GERALD LYNN SHURBET, *Associate Professor of Mathematics*, 1956.
B.A., Texas (Austin), 1949; M.S., Texas Tech, 1957; Ph.D., 1973.

BARBARA MATHEWS SIMMONS, *Professor of Education*, 1973.
B.S., Texas Woman's, 1958; M.Ed., Texas Tech, 1968; Ed.D., 1973.

**ROSLYN L. SIMOWITZ, *Assistant Professor of Political Science*, 1980.
B.A., Brooklyn, 1971; M.A., Indiana, 1973; Ph.D., 1979.

VERA LOIE JARRARD SIMPSON, *Associate Professor of Speech Communication*, 1964.
B.A., Texas Tech, 1962; M.A., 1965; Ph.D., Wayne State, 1972.

FRANK F. SKILLERN, *Professor of Law*, 1971.
A.B., Chicago, 1964; J.D., Denver, 1966; LL.M., Michigan, 1969; Member State Bar (Colorado, Texas).

GERALD DUANE SKOOG, *Professor of Education and Area Coordinator, Secondary Education*, 1969.
B.S., Nebraska, 1958; M.A., Northern Iowa, 1963; Ed.D., Nebraska, 1969.

JAMES L. SMITH, *Assistant Professor of Industrial Engineering*, 1979.
B.S., Northwestern, 1971; M.S., Texas (Arlington), 1973; Ph.D., Auburn, 1980.

*JAMES T. SMITH, *Professor of Petroleum Engineering*, 1976.
B.S. in Petr. Engr., Mississippi State, 1965; M.S. in Petr. Engr., 1967; Ph.D., Pennsylvania State, 1971.

JIMMY HIRAM SMITH, *Professor of Civil Engineering and Interim Dean, College of Engineering*, 1963.
B.S., Texas Tech, 1962; M.S., 1963; Ph.D., Arizona, 1968; Reg. Prof. Engr. (Texas).

KIM CLIFTON SMITH, *Assistant Professor of Art*, 1980.
B.A., Washington, 1966; M.A., California (Berkeley), 1969; Ph.D., Brown, 1983.

MILTON LOUIS SMITH, *Professor of Industrial Engineering*, 1968.
B.S., Texas Tech, 1961; M.S., 1966; Ph.D., 1968; Reg. Prof. Engr. (Texas).

ROLAND EDGAR SMITH, *Professor of Political Science*, 1968.
A.B., Pacific, 1950; M.A., Oregon, 1960; Ph.D., 1970.

ROSSLYN M. SMITH, *Associate Professor of Romance Languages*, 1979.
B.A., New Mexico, 1968; M.A., Wisconsin, 1970; Ph.D., New Mexico, 1975.

JEFFREY ROGER SMITTEN, *Associate Professor of English*, 1972.
B.A., California (Berkeley), 1963; M.A., 1966; Ph.D., Wisconsin (Madison), 1972.

DONNA SOLLIE, *Assistant Professor of Home and Family Life*, 1979.
B.A., Mississippi State, 1973; M.S., Kentucky, 1976; Ph.D., Tennessee, 1979.

PILL-SOON SONG, *Horn Professor of Chemistry*, 1965.
B.S., Seoul National (Korea), 1958; M.S., 1960; Ph.D., California (Davis), 1964.

GWENDOLYN T. SORELL, *Assistant Professor of Home and Family Life*, 1983.
B.A., Goddard Coll., 1976; M.S., Pennsylvania State, 1979; Ph.D., 1981.

GEORGE W. SORENSEN, *Associate Professor of Theatre Arts*, 1976.
B.A., Baylor, 1957; M.A., Colorado, 1966; Ph.D., Missouri (Columbia), 1976.

RONALD EUGENE SOSEBEE, *Professor of Range Management*, 1969.
B.S., Abilene Christian, 1964; M.S., New Mexico State, 1966; Ph.D., Utah State, 1970.

*ROBERTO G. SOTO, Assistant Professor of Law, 1982.
B.A., Texas, 1974; J.D., 1977; Member State Bar (Texas).

VIRGINIA M. SOWELL, *Associate Professor of Education*, 1976.
B.A., Sam Houston State, 1951; M.A., Trinity, 1957; Ph.D., Texas (Austin), 1975.

JULIAN SPALLHOLZ, *Associate Professor of Food and Nutrition*, 1978.
B.S., Colorado State, 1965; M.S., 1968; Ph.D., Hawaii, 1971.

WILLIAM EARL SPARKMAN, *Associate Professor of Education*, 1981.
B.A., Florida, 1969; M.Ed., 1973; Ed.S., 1974; Ph.D., 1975.

ROBERT G. STEADMAN, *Lecturer in Textile Engineering*, 1981.
B.Sc., New South Wales (Australia), 1961; Ph.D., 1968.

CONNIE STEELE, *Associate Professor and Chairperson, Department of Home and Family Life*, 1975.
B.S., Kansas, 1959; M.Ed., Texas Tech, 1971; Ed.D., 1974.

THOMAS L. STEINMEIER, *Associate Professor of Economics*, 1982.
B.A., Northwestern, 1969; Ph.D., Yale, 1975.

CARL HERBERT STEM, *Professor and Dean, College of Business Administration*, 1970.
B.A., Vanderbilt, 1957; A.M., Harvard, 1960; Ph.D., 1969.

TOM BASIL STENIS, *Associate Professor of Electrical Engineering*, 1947.
B.S., Texas (Austin), 1943; M.S., 1947; Reg. Prof. Engr. (Texas).

FRANCIS B. STEPHEN, *Professor of Art*, 1967.
B.F.A., Oklahoma, 1950; M.F.A., 1951.

WILLIAM ADDISON STEWART, *Professor of Architecture*, 1965.
B.A., Florida, 1958.

JERRY DON STOCKTON, *Associate Professor and Chairperson, Department of Agricultural Education*, 1975.
B.S., Texas Tech, 1960; M.E., 1961; Ed.D., Oklahoma State, 1975.

ARTHUR L. STOECKER, *Associate Professor of Agricultural Economics,* 1978.
B.S., Kansas State, 1965; M.S., Iowa State, 1968; Ph.D., 1974.

BARBARA J. STOECKER, *Associate Professor of Food and Nutrition,* 1979.
B.S., Kansas State, 1965; Ph.D., Iowa State, 1970.

CAL D. STOLTENBERG, *Assistant Professor of Psychology,* 1981.
B.A., Midland Lutheran, 1975; M.A., Nebraska, 1977; Ph.D., Iowa, 1981.

MICHAEL STOUNE, *Professor of Music,* 1973.
B.M., Texas (Austin), 1962; M.M., 1965; D.M.A., Michigan (Ann Arbor), 1972.

GARY E. STRATHEARN, *Assistant Professor of Geosciences,* 1983.
B.S., California (Los Angeles), 1978; Ph.D., 1983.

LORUM H. STRATTON, *Associate Professor of Romance Languages and Chairperson, Department of Classical and Romance Languages,* 1969.
B.A., Brigham Young, 1963; M.A., Arizona, 1967; Ph.D., 1971.

LINDA COHEN STRAUSS, *Assistant Professor of Speech and Hearing Sciences,* 1981.
B.A., Queens Coll., City U. of New York, 1966; M.A., Teachers Coll., Columbia, 1967; M.Ed., 1980; Ed.D., 1981.

MONTY JOSEPH STRAUSS, *Associate Professor of Mathematics,* 1971.
B.A., Rice, 1967; Ph.D., Courant Inst. of Mathematical Sciences (New York U.), 1971.

BETTY ANN STREET, *Associate Professor of Art, 1967.*
B.S., Tennessee, 1958; M.S., 1959.

RICHARD L. STREET, JR., *Assistant Professor of Speech Communication,* 1982.
B.A., Texas Tech, 1975; M.A., 1977; Ph.D., Texas, 1980.

SHIRLEY MARIE STRETCH, *Assistant Professor of Clothing and Textiles,* 1980.
B.S., Nebraska, 1971; M.S., Kansas State, 1972; M.B.A., Ohio State, 1977; Ph.D., 1982.

JAMES HASSLER STRICKLAND, JR., *Professor of Mechanical Engineering,* 1973.
B.S., Texas Tech, 1965; M.S., Southern Methodist, 1970; Ph.D., 1973; Reg. Prof. Engr. (Texas).

CYNTHIA JANE STURGIS, *Assistant Professor of History,* 1983.
B.A., William & Mary, 1975; M.A., Utah, 1978; Ph.D., 1983.

JEFF A. STUYT, *Assistant Professor of Health, Physical Education, and Recreation,* 1979.
B.A., Wageningen (Holland), 1973; M.S., 1975; Ph.D., Texas A&M, 1979.

RENJENG SU, *Assistant Professor of Electrical Engineering,* 1982.
B.S., Chen-Kung (Taiwan), 1972; M.S., Washington, 1977; D.Sc., 1980.

JAMES SUDDUTH, *Professor of Music,* 1981.
B.M.Ed., Texas Tech, 1963; M.M.Ed., 1969.

ERNEST WALTER SULLIVAN, II, *Professor of English, 1972.*
B.A., California (Los Angeles), 1966; Ph.D., 1973.

C. V. SURENDRAN, *Lecturer in Engineering Technology,* 1978.
B.S. in C.E., India, 1963; B.S. in Arch. Engr., Texas (Austin), 1968; M.S., 1972.

JOHN B. SUTHERLAND, *Assistant Professor of Biological Sciences,* 1981.
A.B., Stanford, 1967; M.S., Wisconsin, 1973; Ph.D., Washington State, 1978.

ROBERT M. SWEAZY, *Professor of Civil Engineering,* 1970.
B.A., Wichita State, 1962; M.S., 1966; Ph.D., Oklahoma, 1970; Reg. Prof. Engr. (Texas).

METIN TAMKOC, *Professor of Political Science,* 1964.
LL.B., Istanbul, 1950; M.A., Maryland, 1955; Ph.D., Georgetown, 1960.

ALEXIS S. TAN, *Professor of Mass Communications,* 1970.
B.S., U. of the Philippines, 1964; M.S., Wisconsin (Madison), 1966; Ph.D., 1970.

DONALD R. TANNER, *Assistant Professor of Music,* 1977.
B.Mus.Ed., MacPhail Coll. of Music, 1954; M.Mus.Ed., 1956; Ph.D., Minnesota, 1974.

JERI TANNER, *Associate Professor of English,* 1966.
B.A., East Texas State, 1961; M.A., 1963; Ph.D., Texas Tech, 1968.

RICHARD A. TARTER, *Captain, U.S.A.F., Assistant Professor of Aerospace Studies,* 1982.
B.A., East Texas State, 1973; M.A., 1978.

J. DALTON TARWATER, *Professor of Mathematics*, 1968.
B.S., Texas Tech, 1959; M.A., New Mexico, 1961; Ph.D., 1965.

HAZEL S. TAYLOR, *Associate Professor of Education*, 1973.
B.S., Prairie View Coll., 1946; M.Ed., Texas Tech, 1964; Ed.D., 1972.

HOWARD M. TAYLOR, *Rockwell Professor of Plant and Soil Science*, 1982.
B.S., Texas Tech, 1949; Ph.D., California (Davis), 1957.

MERRON H. TEAGUE, *Adjunct Assistant Professor of Education*, 1975.
B.S. in Ed., Northeastern Oklahoma State, 1962; M.Ed., North Texas State, 1968; Ed.D., Texas Tech, 1974.

OTIS WORTH TEMPLER, *Professor and Chairperson, Department of Geography*, 1968.
B.S., Texas A&M, 1954; J.D., Texas (Austin), 1959; M.A., Southern Methodist, 1964; Ph.D., California (Los Angeles), 1969; Member State Bar (Texas).

GEORGE TERESHKOVICH, *Professor of Horticulture and Associate Chairperson, Department of Plant and Soil Science*, 1968.
B.S., Louisiana Tech, 1952; M.S., Georgia, 1957; Ph.D., Louisiana State, 1963.

DAHLIA JEWEL TERRELL, *Professor of English*, 1956.
B.A., Texas Tech, 1940; M.Ed., 1948; Ph.D., Texas (Austin), 1966.

CLARENCE E. TESKE, *Associate Professor of Engineering Technology*, 1975.
B.S. in C.E., Purdue, 1954; M.S., Michigan, 1961; Ph.D., Texas Tech, 1970; Reg. Prof. Engr. (Texas).

CAROLYN JOHNSEN THOMAS, *Lecturer in Law and Assistant Dean, School of Law*, 1982.
B.S., Texas A&M, 1977; J.D., Texas Tech, 1980.

HENRY COFFMAN THOMAS, *Professor and Chairperson, Department of Physics*, 1958.
B.S., Western Kentucky State, 1943; M.S., Vanderbilt, 1948; Ph.D., 1950.

ORLAN EARL THOMAS, *Associate Professor of Music*, 1967.
B.M.E., Nebraska, 1957; M.M., 1958; D.M.A., Eastman School of Music, U. of Rochester, 1973.

ARTHUR DUDLEY THOMPSON, *Professor and Acting Chairperson, Department of Architecture*, 1959.
B.Arch., Texas Tech, 1954; M.S. in Urban Planning, Columbia, 1963.

PAUL EDWARD THOMPSON, *Associate Professor of Mathematics*, 1963.
B.S., New Mexico, 1960; M.S., 1963; Ed.D., Texas Tech, 1968.

VIRGINIA MAHALEY THOMPSON, *Associate Professor of Architecture*, 1964.
B. of Adv. Art and Design, Texas Tech, 1959.

ASHTON G. THORNHILL, *Assistant Professor of Mass Communications*, 1979.
B.B.A., Texas Tech, 1971; M.A., 1974.

POLLY COOK TILTON, *Assistant Professor of Biological Sciences*, 1947.
B.S., Texas Tech, 1947; M.S., 1951.

MYRA BOWNDS TIMMONS, *Associate Professor of Clothing and Textiles*, 1961.
B.S., Texas Tech, 1950; M.S., 1966.

RICHARD WILLIAM TOCK, *Professor of Chemical Engineering*, 1974.
B.S., Iowa (Iowa City), 1963; M.S., 1964; Ph.D., 1967; Reg. Prof. Engr. (Texas).

BEALE TOLBERT, *Instructor in Health, Physical Education, and Recreation*, 1983.
B.S., Texas Tech, 1977.

BETTY M. TOLLEY, *Lecturer in Music*, 1976.

RICHARD EARL TOLLEY, *Professor of Music*, 1959.
B.S., Illinois, 1955; M.S., 1959.

MYRON LEE TRANG, *Associate Professor of Education*, 1971.
B.S., Montana State, 1959; M.Ed., West Texas State, 1968; Ed.D., Washington State, 1971.

IDRIS RHEA TRAYLOR, JR., *Associate Professor of History*, 1965.
B.A., Texas (Austin), 1957; M.A., 1959; Ph.D., Duke, 1965.

LELAND FLOYD TRIBBLE, *Professor of Animal Science*, 1967.
B.S., Missouri, 1949; M.S., 1950; Ph.D., 1956.

ROBERT R. TRIMBLE, *Visiting Associate Professor of Psychology*, 1970.
B.S., Pittsburg State, 1950; M.S., 1957; Ph.D., Oklahoma State, 1965.

THOMAS F. TROST, *Associate Professor of Electrical Engineering,* 1970.
B.S. in E.E., Case Inst. of Technology, 1964; M.S. in E.E., 1966; Ph.D., Case Western Reserve, 1969.

BEN B. TROTTER, *Assistant Professor of Business Administration,* 1982.
B.B.A., Texas A&M, 1959; M.B.A., Harvard, 1963; CPA.

RICHARD CLAYTON TROTTER, *Assistant Professor of Business Administration,* 1983.
B.B.A., Texas (Austin), 1973; J.D., 1976.

ROGER MONROE TROUB, *Professor of Economics,* 1967.
B.B.A., Oklahoma, 1962; M.A., 1967; Ph.D., 1968.

JERZY S. TRZEBINSKI, *Visiting Associate Professor of Psychology,* 1982.
M.A., Warsaw, 1969; Ph.D., 1974.

YUNG-MEI TSAI, *Associate Professor of Sociology and Statistics,* 1973.
B.L., Tunghai U. (Taiwan), 1963; M.A., Hawaii, 1967; M.A., Pittsburgh, 1970; Ph.D., Colorado, 1973.

ANNA TSAO, *Assistant Professor of Mathematics,* 1983.
B.A., Michigan State, 1972; M.S., 1974; Ph.D., Michigan, 1981.

JOE A. TUCKER, *Assistant Professor of Law,* 1982.
B.A., Houston, 1977; J.D., Texas, 1981; Member State Bar (Texas).

FRED DONAVON TURNER, *Associate Professor of Music,* 1971.
B.M., North Texas State, 1965; M.M.E., 1969.

BRIGGS L. TWYMAN, *Associate Professor of History,* 1973.
M.A., Chicago, 1965; Ph.D., 1972.

WILLIE LEE ULICH, *Professor of Agricultural Engineering and Technology,* 1961.
B.S., Texas A&M, 1943; M.S., 1947; Ph.D., Harvard, 1956; Reg. Prof. Engr. (Texas).

**DONALD W. UMPHREY, *Assistant Professor of Mass Communications,* 1979.
B.A., David Lipscomb Coll., 1969; M.A., Texas Tech, 1980.

DAVID EDWARD UPTON, *Associate Professor of Finance,* 1980.
B.A., Connecticut, 1964; M.B.A., 1969; Ph.D., North Carolina, 1976; C.F.A.

LLOYD VICTOR URBAN, *Associate Professor of Civil Engineering,* 1969.
B.S., Texas (Austin), 1965; M.S., 1966; Ph.D., 1971; Reg. Prof. Engr. (Texas).

HUMBERTO VALENCIA, *Assistant Professor of Business Administration,* 1982.
B.S., Carroll Coll. (Wisconsin), 1974; M.B.A., Louisiana State, 1976; M.A., Ohio, 1976; Ph.D., Georgia State, 1982.

C. V. GIRIJA VALLABHAN, *Associate Professor of Civil Engineering,* 1966.
B.S. (Engr), Kerala (Trivandrum, India), 1957; M.S., Missouri (Rolla), 1960; Ph.D., Texas (Austin), 1967; Reg. Prof. Engr. (Texas, New Mexico, and California).

MARY JEANNE VAN APPLEDORN, *Professor of Music,* 1950.
B.M., Eastman School of Music, 1948; M.M., 1950; Ph.D., 1966.

W. PENNINGTON VANN, *Associate Professor of Civil Engineering,* 1972.
B.A., Columbia, 1958; B.S., 1959; M.S., 1960; Ph.D., Rice, 1966.

NANCY L. VAN SLYKE, *Assistant Professor of Occupational Therapy,* 1983.
B.S., State U. of New York (Buffalo), 1970; M.S., Southwest Texas, 1976.

MARY ANN VAUGHAN, *Associate Professor of Music,* 1967.
B.M.E., Eastern New Mexico, 1955; M.M., Arizona, 1966.

RAYMOND C. VAUGHN, *Part-time Lecturer in Mechanical Engineering,* 1977.
B.S. in M.E., Texas Tech, 1976.

RICHARD VENGROFF, *Professor of Political Science,* 1972.
B.A., State U. of New York (Stony Brook), 1967; M.S.S., Syracuse, 1970; Ph.D., 1972.

*HAROLD DEAN VICTORY, JR., *Associate Professor of Mathematics,* 1974.
B.A., Rice, 1968; M.S., Purdue, 1970; Ph.D., 1974.

DARRELL LEE VINES, *Professor of Electrical Engineering and Computer Science,* 1962.
B.S., McMurry, 1959; B.S. in E.E., Texas Tech, 1959; M.S. in E.E., 1960; Ph.D., Texas A&M, 1967; Reg. Prof. Engr. (Texas).

FREDERICK C. VOLKER, *Lecturer in Business Administration,* 1980.
B.S., Ohio State, 1971; M.B.A., Texas Tech, 1973.

CHARLES ERNEST WADE, *Associate Professor of Finance,* 1965.
B.B.A., Arlington State, 1961; M.B.A., North Texas State, 1962; Ph.D., Oklahoma, 1966.

JACK DOUGLAS WAGES, *Professor of English,* 1968.
B.A., North Texas State, 1960; M.A., Texas (Austin), 1963; Ph.D., Tennessee, 1968.

BETTY SUE MALONE WAGNER, *Assistant Professor of Home and Family Life,* 1966.
B.S., Texas Tech, 1950; M.S., 1966; Ph.D., Texas (Austin), 1981.

FRED PHILIP WAGNER, JR., *Associate Professor of Engineering Technology and Associate Dean, College of Engineering,* 1967.
B.S., Texas Tech, 1950; M.S., 1968; Ph.D., 1971; Reg. Prof. Engr. (Texas).

HARRY STUART WALKER, *Associate Professor of Economics,* 1953.
B.A., Denver, 1948; M.B.A., 1950.

WARREN STANLEY WALKER, *Horn Professor of English,* 1964.
B.A., State U. of New York (Albany), 1947; M.A., 1948; Ph.D., Cornell, 1951.

JOHN FRANK WALKUP, *Professor of Electrical Engineering,* 1971.
B.A., Dartmouth, 1962; B.E.E., 1963; M.S., Stanford, 1965; Engineer, 1969; Ph.D., 1971; Reg. Prof. Engr. (Texas).

ROBERT DOUGLAS WALKUP, *Assistant Professor of Chemistry,* 1983.
B.A., Delaware, 1974; Ph.D., Stanford, 1981.

DERALD DEE WALLING, *Associate Professor of Mathematics,* 1966.
B.S., Iowa State Coll., 1958; M.S., Iowa State, 1961; Ph.D., 1963.

MICHAEL P. WALSH, *Lecturer in English,* 1983.
B.A., Sussex, 1975; M.A., 1976.

JAMES KEITH WANGBERG, *Associate Professor and Chairperson, Department of Entomology,* 1976.
B.A., Humboldt State, 1969; M.A., 1973; Ph.D., Idaho, 1976.

JON PAULLIN WARDRIP, *Assistant Professor of Mass Communications,* 1974.
B.A., Arizona, 1962; M.A., Iowa, 1964; Ph.D., Texas (Austin), 1979.

ROBERT J. WARREN, *Assistant Professor of Wildlife Management,* 1979.
B.S., Oklahoma State, 1974; M.S., Virginia Polytechnic Inst. and State U., 1976; Ph.D., 1979.

LENA W. WATERS, *Instructor in English,* 1982.
B.A., Baylor, 1946; M.A., 1948; Ph.D., Texas Tech, 1974.

SARA WATERS, *Associate Professor of Art,* 1977.
B.F.A., Spalding Coll., 1974; M.F.A., Indiana, 1977.

ANTHONY BIDEN WAY, *Associate Professor of Anthropology and Preventive Medicine and Community Health,* 1972.
B.A., Williams Coll., 1962; M.D., Pennsylvania, 1967; Ph.D., Wisconsin (Madison), 1972.

RICHARD A. WEAVER, *Professor and Chairperson, Department of Theatre Arts,* 1972.
B.F.A., Oklahoma, 1959; M.F.A., 1964; Ph.D., Missouri, 1973.

MARCIA WEBER-OLSEN, *Assistant Professor of Speech and Hearing Sciences,* 1981.
B.A., San Jose State, 1972; M.A., Kansas, 1973; Ph.D., 1978.

JANE B. WEEDMAN, *Assistant Professor of English,* 1981.
B.S., Indiana, 1965; M.A., Dayton, 1974; Ph.D., State U. of New York (Buffalo), 1979.

LINDEN WEESE, *Instructor in Health, Physical Education, and Recreation,* 1982.
B.S., Northwestern Oklahoma State, 1976.

DAVID A. WEINBERG, *Assistant Professor of Mathematics,* 1980.
S.B., Chicago, 1974; Ph.D., Wisconsin (Madison), 1980.

LEONARD H. WEINER, *Associate Professor of Computer Science,* 1976.
B.S. in E.S., Illinois Inst. of Technology, 1964; M.S. in C.S., Northwestern, 1965; Ph.D., 1970.

JOEL C. WEINSHEIMER, *Associate Professor of English,* 1973.
B.A., State U. of New York (Buffalo), 1967; M.A., Ohio, 1969; Ph.D., 1973.

STEPHEN E. WEISBERG, *Instructor in Biblical Literature,* 1980.
B.A., Brandeis, 1958; M.A., Rabbinical Ordination, Hebrew Union Coll.-Jewish Inst. of Religion, 1963.

KATHERINE A. WELTER, *Instructor in Health, Physical Education, and Recreation,* 1982.
B.A., Kearney State, 1976; M.S., Western Illinois, 1978.

DAVID A. WELTON, *Professor of Education and Area Coordinator, Early Childhood/Elementary Education,* 1976.
B.A., Western Reserve, 1961; B.S., Kent State, 1962; M.Ed., Ohio, 1966; Ph.D., 1970.

CHARLES W. WENDT, *Adjunct Professor of Plant and Soil Science,* 1980.
B.S., Texas A&M, 1951; M.S., Texas Tech, 1957; Ph.D., Texas A&M, 1966.

ROBERT A. WENINGER, *Professor of Law,* 1974.
B.B.A., Wisconsin, 1955; LL.B., 1960; LL.M., Chicago, 1964; CPA; Member State Bar (Wisconsin and California).

WILLIAM F. WESTNEY, *Associate Professor of Music, Browning Artist in Residence,* 1978.
B.A., Queens (City U. of New York), 1968; M.M.A., Yale, 1971; D.M.A., 1975.

DOLORES ANN WHEELER, *Instructor in Health, Physical Education, and Recreation,* 1983.
B.S., Drake, 1982; M.S., Western Illinois, 1983.

LAWRENCE WHEELESS, *Professor of Speech Communication,* 1982.
B.A., Texas Christian, 1964; M.A., Houston, 1967; Ph.D., Wayne State, 1970.

VIRGINIA EMAN WHEELESS, *Assistant Professor of Speech Communication,* 1982.
B.A., Kearney State, 1969; M.A., Colorado State, 1971; Ph.D., Nebraska, 1977.

ROBERT D. WHIPPLE, JR., *Lecturer in English,* 1983.
B.A., Texas Tech, 1979; M.A., Texas, 1983.

GARY E. WHITE, *Professor of Business Administration and Director of Accounting Programs,* 1979.
B.S., Colorado, 1963; M.A.S., Illinois, 1964; Ph.D., Washington, 1969; CPA.

JAMES EDMUND WHITE, *Associate Professor of Architecture,* 1971.
B.Arch., Texas (Austin), 1957; M.S., Texas Tech, 1973; Reg. Arch. (Texas).

JOHN POSTON WHITE, *Associate Professor of Architecture,* 1973.
B.Arch., Texas (Austin), 1957; M.Arch., Nebraska, 1973; Reg. Arch. (Texas, New Mexico, Arizona).

JOHN THOMAS WHITE, *Associate Professor and Chairperson, Department of Mathematics,* 1965.
B.A., Texas (Austin), 1952; M.A., 1953; Ph.D., 1962.

MARTIN B. WHITE, *Associate Professor of Law,* 1982.
A.B., Columbia, 1971; J.D., Michigan, 1974; Member State Bar (Maryland and District of Columbia).

CARLTON J. WHITEHEAD, *Professor of Management,* 1965.
B.S., Southeastern Louisiana, 1959; M.B.A., Louisiana State, 1962; Ph.D., 1964.

JAMES DANIEL WHITFIELD, *Lecturer in Journalism,* 1980.
B.J., Missouri (Columbia), 1971; M.A., North Texas State, 1977.

JAMES S. WHITLARK, *Assistant Professor of English,* 1979.
B.A., Wayne State, 1971; M.A., 1973; Ph.D., Chicago, 1976.

JULIA CAROL WHITSITT, *Assistant Professor of English,* 1978.
A.B., Dickinson, 1972; Ph.D., California (Berkeley), 1977.

SANDRA G. WHITTLE, *Lecturer in English,* 1983.
B.A., Texas Tech, 1978; M.A., 1982.

ROBERT JEFFERY WHITWORTH, *Assistant Professor of Entomology,* 1982.
B.A., Kansas Wesleyan, 1971; M.S., Kansas State, 1977; Ph.D., 1980.

JEREMY C. WICKER, *Professor of Law,* 1972.
B.E.E., Georgia Inst. of Technology, 1965; J.D., Houston, 1970; LL.M., Yale, 1972; Member State Bar (Texas).

JAMES B. WILCOX, *Professor of Business Administration,* 1975.
B.S., Pennsylvania State, 1967; M.B.A., Indiana, 1970; D.B.A., 1972.

RICHARD EDWARD WILDE, *Professor of Chemistry,* 1963.
B.S., California (Los Angeles), 1956; Ph.D., Washington, 1961.

ROBERT EDWARD WILKES, *Professor of Business Administration,* 1976.
B.S.B.A., Samford, 1963; M.B.A., Alabama, 1969; Ph.D., 1971.

RICHARD LEWIS WILLHAM, *Adjunct Professor of Animal Science,* 1983.
B.S., Oklahoma, 1954; M.S., Iowa, 1955; Ph.D., 1960.

FRAZER WILLIAMS, *Associate Professor of Electrical Sciences and Physics,* 1976.
B.S., California Inst. of Technology, 1967; Ph.D., Southern California, 1973.

PEGGY JEAN WILLIAMS, *Associate Professor of Health, Physical Education, and Recreation,* 1962.
B.S., East Texas State, 1950; M.Ed., 1953.

WILLARD FOREST WILLIAMS, *Horn Professor of Agricultural Economics,* 1963.
B.S., Oregon State, 1947; M.S., California (Berkeley), 1948; Ph.D., Purdue, 1952.

HORACE HAMPTON WILLIAMSON, *Associate Professor of Architecture,* 1973.
B.S., Georgia Inst. of Technology, 1951; B.Arch., 1952; M.S., Rensselaer Polytechnic Inst., 1969; M.Arch., 1969; Ph.D., Utah, 1975; Reg. Arch. (Texas, Florida).

MICHAEL R. WILLIG, *Assistant Professor of Biological Sciences,* 1983.
B.S., Pittsburgh, 1974; Ph.D., 1982.

WELBORN KIEFER WILLINGHAM, *Professor of Education,* 1961.
B.A., Texas Tech, 1949; M.Ed., Texas (Austin), 1956; Ph.D., Texas Tech, 1964; Lic. Psychol. (Texas).

JERRY W. WILLIS, *Professor of Education,* 1978.
B.A., Union, 1965; M.A., Alabama, 1967; Ph.D., 1970.

MARGARET EILEEN WILLIS, *Associate Professor of Health, Physical Education, and Recreation,* 1972.
B.F.A., Texas Christian, 1970; M.F.A., 1972.

DOROTHY D. WILLS, *Visiting Assistant Professor of Anthropology,* 1984.
A.B., Mount Holyoke, 1969; M.A., Texas (Austin), 1972; Ph.D., 1977.

DEBBIE J. WILSON, *Part-time Instructor in Speech and Hearing Sciences,* 1983.
B.S., Southwest Texas State, 1980; M.Ed., 1980.

JANE ANN HENRY WILSON, *Associate Professor of Music,* 1970.
B.M., Texas Tech, 1962; M.M., Indiana, 1965; D.Mus., Indiana, 1982.

MARGARET EILEEN WILSON, *Professor of Health, Physical Education, and Recreation,* 1965.
B.S.E., Arkansas, 1944; M.S., 1949; Ph.D., State U. of Iowa, 1960.

MARK A. WILSON, *Assistant Professor of Management,* 1981.
B.A., Wartburg Coll., 1975; M.A., Missouri (Kansas City), 1979; Ph.D., Ohio State, 1983.

MARY C. WILSON, *Part-time Instructor in Mass Communications,* 1983.
B.A., Texas Tech, 1938; M.S., 1959.

JANE LOUISE WINER, *Associate Professor of Psychology,* 1975.
B.A., State U. of New York (Albany), 1969; M.L.S., 1970; M.A., Ohio State, 1971; Ph.D., 1975; Lic. and Cert. Psychol. (Texas).

HERALD WARREN WINKLER, *Professor of Petroleum Engineering,* 1970.
B.S. in M.E., Southern Methodist, 1948; M.S. in Petr. Engr., Houston, 1962; Ph.D., Texas (Austin), 1969; Reg. Prof. Engr. (Texas).

JOHN WITTMAN, *Professor and Chairperson, Department of Economics,* 1960.
B.S. in B.C., Southern State Coll. (Arkansas), 1957; M.B.A., Arkansas, 1959; Ph.D., 1965.

HERSHEL L. WOMACK, JR., *Assistant Professor of Mass Communications,* 1972.
B.S., Sam Houston State, 1967; M.S., Illinois Inst. of Technology, 1976.

DIANE SYLVIA WOOD, *Associate Professor of Romance Languages,* 1976.
B.A., Northern Iowa, 1968; M.A., 1971; Ph.D., Wisconsin, 1975.

*ROBERT E. WOOD, JR., *Professor of Law,* 1976.
B.A., Texas Tech, 1965; J.D., Vanderbilt, 1968; Member State Bar (Texas and Florida).

VAN RICHARD WOOD, *Assistant Professor of Marketing,* 1982.
B.A., Washington, 1973; M.B.A., 1975; Ph.D., 1982.

ELEANOR M. WOODSON, *Associate Professor of Clothing and Textiles,* 1970.
B.S., Oregon State, 1948; M.S., Texas Tech, 1961; Ed.D., 1969.

WARREN K. WRAY, *Assistant Professor of Civil Engineering,* 1978.
B.S., Washburn, 1967; B.S., Kansas State, 1968; M.S., Air Force Inst. of Technology, 1974; Ph.D., Texas A&M, 1978; Reg. Prof. Engr. (Ohio, Texas, New Mexico)

HENRY ALBERT WRIGHT, *Horn Professor of Range Management and Chairperson, Department of Range and Wildlife Management,* 1967.
B.S., California (Davis), 1957; M.S., Utah State, 1962; Ph.D., 1964.

JOHN REMLEY WUNDER, *Associate Professor of History and Law,* 1978.
B.A., Iowa, 1967; M.A., 1970; J.D., 1970; Ph.D., Washington, 1974.

SURYA B. YADAV, *Assistant Professor of Information Systems,* 1981.
B.Sc.E.E., Banaras Hindu (India), 1972; M.Tech., Indian Inst. of Technology Kanpur (India), 1974; M.B.I.S., Georgia State, 1978; Ph.D., 1981.

JOSEPH PAUL YANEY, *Professor of Business Administration,* 1979.
A.B., Michigan, 1961; M.B.A., 1964; J.D., 1964; Ph.D., 1969.

SHIANG PING YANG, *Professor and Acting Chairperson, Department of Food and Nutrition,* 1969.
B.S., National Central (China), 1942; M.S., Iowa State, 1949; Ph.D., 1956.

VESTAL LIARLY YEATS, *Assistant Professor of Geosciences,* 1960.
B.S., Texas (Austin), 1958; M.S., Texas Tech, 1960.

SHIRLEY SHIU-FANG YU, *Assistant Professor of Economics,* 1981.
B.A., National Taiwan, 1971; M.S., Oklahoma State, 1973; Ph.D., 1981.

BONG-JIN YUM, *Assistant Professor of Industrial Engineering,* 1982.
B.S., Korea, 1971; M.S., Oregon, 1977; Ph.D., Ohio, 1981.

RICHARD E. ZARTMAN, *Associate Professor of Soil Physics,* 1974.
B.S., Ohio State, 1968; Ph.D., Kentucky, 1974.

JAN ZIMMERMAN, *Assistant Professor of History,* 1983.
B.A., Wisconsin, 1975; Ph.D., Northwestern, 1982.

PAUL E. ZINTGRAFF, *Professor of Education,* 1974.
B.Ed., Toledo, 1938; M.Ed., Miami, 1940; Ed.D., Florida State, 1947.

EDWARD WILLIAM ZUKAUCKAS, JR., *Associate Professor of Horticulture,* 1952.
B.S., Rutgers, 1950; M.S., 1952.

WOLODYMYR TARAS ZYLA, *Professor of Slavic Languages and Literature,* 1963.
B.S., Manitoba (Canada), 1959; M.A., 1962; Ph.D., Free Ukrainian U. (Munich, Germany), 1967.

Emeritus Faculty and Administrative Officers

(Dates indicate years at Texas Tech)

BURL MONROE ABEL, *Associate Professor of Business Administration, Emeritus,* 1955-1973.
VIVIAN JOHNSON ADAMS, *Professor of Home Economics Education, Emeritus,* 1928-1962.
JAMES GEORGE ALLEN, *Dean of Student Life and Professor of English, Emeritus,* 1927-1972.
LOUISE CRAWFORD ALLEN, *Associate Professor of Journalism, Emeritus,* 1928-1963.
HUGH ALLEN ANDERSON, *Associate Professor of Economics, Emeritus,* 1939-1972.
ROBERT HENRY ANDERSON, *Professor and Dean of Education, Emeritus,* 1973-1983.
WILLIAM BURNSIDE ARPER, *Professor of Geosciences, Emeritus,* 1953-1979.
JOHN WILLARD AULT, *Associate Professor of Mathematics, Emeritus,* 1965-1975.
FRANK LORENZO BAIRD, *Associate Professor of Political Science, Emeritus,* 1968-1981.
GLENN E. BARNETT, *Professor of Education and Vice President, Emeritus,* 1968-1981.
NOLAN ELLMORE BARRICK, *Kleinschmidt Professor of Architecture, Emeritus,* 1953-1979.
LOTUS BERRY BLACKWELL, *Associate Professor of Business Administration, Emeritus,* 1948-1981.

DIXIE BOYD, *Assistant Professor of Psychology, Emeritus,* 1960-1974.
JOHN PAUL BRAND, *Professor of Geosciences, Emeritus,* 1948-1979.
NEVILLE HASSO BREMER, *Professor of Education, Emeritus,* 1965-1978.
MARY LOUISE BREWER, *Associate Professor of English, Emeritus,* 1941-1973.
RAYMOND HECTOR BROGNIEZ, *Associate Professor of Architecture, Emeritus,* 1965-1979.
PETER DRAGO BUBRESKO, *Associate Professor of Classical and Romance Languages, Emeritus,* 1964-1977.
FAYE LAVERNE BUMPASS, *Horn Professor of Classical and Romance Languages, Emeritus,* 1939-1978.
EDNA WALKER BUSTER, *Associate Professor of Clothing and Textiles, Emeritus,* 1927-1955.
WILLIAM GASTON CAIN, JR., *Professor of Business Administration, Emeritus,* 1955-1979.
TRUMAN WILDES CAMP, *Professor of English, Emeritus,* 1935-1973.
MARY SUE CARLOCK, *Professor of English, Emeritus,* 1952-1974.
ILA MAE CARPENTER, *Associate Professor of Mathematics, Emeritus,* 1956-1981.
OWEN LaVERNE CASKEY, *Professor of Education, Emeritus,* 1947-1983.
ORLO ECKERSLEY CHILDS, *University Professor, Emeritus,* 1970-1979.
SAM WHITEN CHISHOLM, *Professor of Business Administration, Emeritus,* 1941-1981.
WARREN PERRY CLEMENT, *Registrar, Emeritus,* 1926-1961.
VERNON THOMAS CLOVER, *Professor of Economics, Emeritus,* 1947-1975.
ALDRENA BEATRIX COBB, *Horn Professor of Psychology, Emeritus,* 1958-1972.
SEYMOUR VAUGHAN CONNOR, *Professor of History, Emeritus,* 1953-1979.
MARY BURWELL DABNEY, *Professor of Health, Physical Education, and Recreation for Women, Emeritus,* 1952-1976.
CHARLES EDWIN DALE, *Professor of Business Administration, Emeritus,* 1956-1983.
RAYMOND LEON DAVIDSON, *Professor of Education, Emeritus,* 1949-1970.
JAMES WILLIAM DAVIS, *Professor of Political Science, Emeritus,* 1938-1974.
CHARLES GARFIELD DECKER, *Professor of Civil Engineering, Emeritus,* 1938-1970.
JOE DENNIS, *Professor of Chemistry, Emeritus,* 1938-1976.
LOLA MARIE DREW, *Associate Professor of Home and Family Life, Emeritus,* 1946-1972.
ROY SYLVAN DUNN, *Associate Professor of Sociology, Emeritus,* 1956-1977.
RALPH MARION DURHAM, *Professor of Animal Science, Emeritus,* 1959-1980.
GEORGE OLIVER ELLE, *Professor of Horticulture, Emeritus,* 1938-1977.
RAYMOND PRUITT ELLIOTT, *Professor of Music, Emeritus,* 1950-1969.
WILLIAM CLARK ELLZEY, *Professor of Home and Family Life, Emeritus,* 1966-1974.
PATRICE MARGARET CATLIN FLEMING, *Professor of Education, Emeritus,* 1967-1978.
MARQUIS LYNDON FOWLER, *Professor of Agricultural Economics, Emeritus,* 1966-1979.
KENNETH HOWARD FREEMAN, *Professor of Education, Emeritus,* 1969-1980.
GORDON FULLER, *Professor of Mathematics, Emeritus,* 1950-1968.
EUNICE JOINER GATES, *Professor of Foreign Languages, Emeritus,* 1925-1963.
MARY AGNES GERLACH, *Associate Professor of Clothing and Textiles, Emeritus,* 1955-1982.
EVERETT ALDEN GILLIS, *Professor of English, Emeritus,* 1949-1979.
ROBERT CABANISS GOODWIN, *Professor of Chemistry and President, Emeritus,* 1930-1967.
LAWRENCE LESTER GRAVES, *Professor of History and Dean of Arts and Sciences, Emeritus,* 1955-1983.
LOLA BETH GREEN, *Associate Professor of English, Emeritus,* 1946-1973.
HIRAM VARNER GREER, *Associate Professor of Art, Emeritus,* 1963-1982.
ARNOLD JARVIS GULLY, *Professor of Chemical Engineering and Engineering Technology, Emeritus,* 1963-1982.
ALAN MURRAY FINLAY GUINN, *Professor of English, Emeritus,* 1939-1969.
THOMAS EARLE HAMILTON, *Professor of Classical and Romance Languages, Emeritus,* 1940-1971.
CARL HAMMER, JR., *Horn Professor of Germanic and Slavic Languages, Emeritus,* 1964-1978.
FRED GEORGE HARBAUGH, *Professor of Animal Science, Emeritus,* 1927-1970.
LEVI MARLIN HARGRAVE, *Professor of Agricultural Education, Emeritus,* 1946-1977.

CLARK HARVEY, *Professor of Plant and Soil Science, Emeritus,* 1954-1979.
ELLIS RICHARD HEINEMAN, *Professor of Mathematics, Emeritus,* 1928-1973.
DONALD JACOB HELMERS, *Professor of Engineering Technology and Mechanical Engineering, Emeritus,* 1948-1982.
GENE LeCLAIR HEMMLE, *Professor of Music, Emeritus,* 1949-1979.
WILLIAM CURRY HOLDEN, *Professor of History, Emeritus,* 1929-1968.
LYNWOOD M. HOLLAND, *Professor of Political Science, Emeritus,* 1967-1971.
CECIL HORNE, *Professor of Journalism, Emeritus,* 1926-1951.
EDNA NAWANNA HOUGHTON, *Associate Professor of Art, Emeritus,* 1932-1973.
CHARLES ERNEST HOUSTON, *Professor of Electrical Engineering, Emeritus,* 1932-1974.
DOROTHY BEATRICE HOYLE, *Professor of Health, Physical Education, and Recreation, Emeritus,* 1951-1982.
RAY CURTIS JANEWAY, *Director of Library Services, Emeritus,* 1949-1982.
CHESTER CARTWRIGHT JAYNES, *Associate Professor of Plant and Soil Science, Emeritus,* 1951-1978.
WILLIAM MORELY JENNINGS, *Professor of Health, Physical Education, and Recreation for Men, Emeritus,* 1941-1966.
PHILIP JOHNSON, *Professor of Petroleum Engineering, Emeritus,* 1947-1976.
EDWARD NEWLON JONES, *President, Emeritus,* 1948-1959.
LEWIS NORTON JONES, *Dean of Students, Emeritus,* 1938-1978.
U. V. JONES, *Professor of Law, Emeritus,* 1966-1980.
EARL EUGENE KENNEY, *Professor of Music, Emeritus,* 1957-1982.
MARLIN DEAN KILLION, *Director of Bands, Emeritus,* 1959-
LILA ALLRED KINCHEN, *Associate Professor of Clothing and Textiles, Emeritus,* 1939-1967.
CLARENCE EVERIT KINCAID, JR., *Horn Professor of Art, Emeritus,* 1960-1982.
RAMON WALTER KIREILIS, *Professor of Health, Physical Education, and Recreation, Emeritus,* 1950-1979.
DWIGHT LOUIS KIRK, *Professor of Education, Emeritus,* 1966-1979.
PUN-KIEN KOH, *Professor of Mechanical Engineering, Emeritus,* 1966-1979.
LYLE CARLTON KUHNLEY, *Associate Professor of Biological Sciences, Emeritus,* 1959-1981.
JAMES EDWARD KUNTZ, *Professor of Psychology, Emeritus,* 1951-1975.
MINA MARIE WOLF LAMB, *Margaret W. Weeks Professor of Food and Nutrition, Emeritus,* 1940-1975.
JOHNNYE GILKERSON LANGFORD, *Professor of Physical Education, Emeritus,* 1925-1950.
PAUL MERVILLE LARSON, *Professor of Speech and Theatre Arts, Emeritus,* 1950-1973.
THOMAS LUTHER LEACH, *Professor of Agricultural Education, Emeritus,* 1937-1978.
HELEN ALMA LINDELL, *Assistant Professor of Speech, Emeritus,* 1948-1969.
IVAN LEE LITTLE, *Professor of Philosophy, Emeritus,* 1946-1979.
THOMAS BROOKS LIVINGSTON, *Professor of Education, Emeritus,* 1949-1972.
HELEN TROY ALLEN LOCKARD, *Professor of Art, Emeritus,* 1937-1975.
DONALD SHERMAN LONGWORTH, *Professor of Home and Family Life, Emeritus,* 1966-1982.
THOMAS GREEN MANNING, *Professor of History, Emeritus,* 1956-1979.
ROBERT LOUIS MASON, *Professor of Mechanical Engineering, Emeritus,* 1934-1981.
RICHARD BENJAMIN MATTOX, *Professor of Geosciences, Emeritus,* 1954-1982.
BRUCE DOUGLAS MATTSON, *Professor of Education, Emeritus,* 1965-1983.
JOSEPH THOMAS McCULLEN, JR., *Professor of English, Emeritus,* 1949-1980.
DONALD McDONALD, *Professor of Education and Library Science, Emeritus,* 1948-1982.
GEORGE PEYTON MECHAM, *Professor of Education, Emeritus,* 1951-1970.
MHYRA SCHWAY MINNIS, *Professor of Sociology, Emeritus,* 1962-1975.
EVELYN INA MONTGOMERY, *Professor of Anthropology, Emeritus,* 1964-1979.
SIBYL PIRTLE MORRISON, *Associate Director of the Library, Emeritus,* 1947-1983.
DONALD VAN DALE MURPHY, *Associate Professor of English, Emeritus,* 1926-1963.
LEVI MARSHALL NAGLE, JR., *Professor of Education, Emeritus,* 1959-1978.
KLINE ALLEN NALL, *Professor of English, Emeritus,* 1944-1980.

ROBERT LEE NEWELL, *Professor of Mechanical Engineering and Engineering Technology, Emeritus,* 1941-1982.
ROBERT MARSHALL PARKER, *Associate Professor of Mathematics, Emeritus,* 1946-1973.
RODERICK PARKINSON, *Associate Professor of Art, Emeritus,* 1946-1975.
CLIFFORD MARION PARRISH, *Associate Professor of Civil Engineering, Emeritus,* 1949-1982.
BILL J. PARSLEY, *Vice President for Public Affairs, Emeritus,* 1966-1983.
L. E. PARSONS, *Professor of Textile Engineering and Clothing and Textiles, Emeritus,* 1942-1977.
WILLIAM ROBERT PASEWARK, *Professor of Education, Emeritus,* 1956-1982.
MILTON LESTER PEEPLES, *Professor of Food Technology, Emeritus,* 1951-1980.
CONNER COLUMBUS PERRYMAN, *Professor of Engineering Drawing, Emeritus,* 1929-1965.
GEORGE REX PHILBRICK, *Professor of Health, Physical Education, and Recreation, Emeritus,* 1941-1979.
FANNIE ERNESTINE PILLOW, *Associate Professor of Education, Emeritus,* 1965-1976.
LOUIS JOHN POWERS, *Professor of Mechanical Engineering, Emeritus,* 1942-1979.
SUE AVA RAINEY, *Professor of Health, Physical Education, and Recreation for Women, Emeritus,* 1945-1968.
HELEN CALDWELL RANDLE, *Associate Professor of Home and Family Life, Emeritus,* 1965-1977.
CHARLES WESLEY REBSTOCK, *Associate Professor of Education, Emeritus,* 1966-1982.
JULES ALEXANDER RENARD, *Professor of Chemical Engineering, Emeritus,* 1951-1970.
FRED DURNFORD RIGBY, *Professor of Mathematics, Emeritus,* 1940-1980.
DELILAH MANIRE ROCH, *Associate Professor of Clothing and Textiles, Emeritus,* 1967-1982.
JOHN ROBERT ROGERS, *Professor of Education, Emeritus,* 1970-1980.
REGINALD RUSHING, *Professor of Accounting, Emeritus,* 1939-1971.
WILLIAM DeRAY SANDEL, *Professor of Industrial Engineering, Emeritus,* 1966-1976.
THEODORE WILLIAM SCHETTLER, *Associate Professor of Music, Emeritus,* 1968-1983.
RONALD EDWARD SCHULZ, *Professor of Theatre Arts, Emeritus,* 1952-1982.
JESSE Q. SEALEY, *Professor of Biology, Emeritus,* 1928-1968.
HERMAN BRAZILL SEGREST, *Professor of Health, Physical Education, and Recreation, Emeritus,* 1963-1979.
MARTHA GENE SHELDEN, *Professor of Clothing and Textiles, Emeritus,* 1955-1969.
DOROTHY ESTELLE HAYS SITTON, *Professor of Home and Family Life, Emeritus,* 1959-1975.
FRANCIS B. STEPHEN, *Professor of Art, Emeritus,* 1967-1983.
RUSSELL WILLIAM STRANDTMANN, *Horn Professor of Biological Sciences, Emeritus,* 1948-1975.
ALFRED BELL STREHLI, *Professor of Spanish, Emeritus,* 1928-1969.
ALAN LANG STROUT, *Professor of English, Emeritus,* 1928-1961.
MARGRET RUSSELL STUART, *Associate Professor of Chemistry, Emeritus,* 1946-1979.
HASKELL GRANT TAYLOR, *Professor of Business Administration, Emeritus,* 1936-1978.
FRANK MILLETT TEMPLE, *Associate Director of Library Services, Emeritus,* 1951-1979.
VIRGINIA LEE TOMPKINS, *Associate Professor of Home Economics Education, Emeritus,* 1966-1983.
SCOTTI MAE TUCKER, *Professor of Classical and Romance Languages, Emeritus,* 1943-1972.
WILLIAM PIERCE TUCKER, *Professor of Political Science, Emeritus,* 1967-1977.
KIRK B. TURNER, *Associate Professor of Animal Science, Emeritus,* 1948-1978.
MAYME LUCINDA TWYFORD, *Associate Professor of Food and Nutrition, Emeritus,* 1928-1954.
ELO JOE URBANOVSKY, *Horn Professor of Park Administration, Emeritus,* 1949-1975.
ERNEST WALLACE, *Horn Professor of History, Emeritus,* 1936-1976.
MORRIS SHEPPARD WALLACE, *Horn Professor of Education, Emeritus,* 1955-1974.
LAURA KATHERINE EVANS WALTON, *Professor of Education, Emeritus,* 1951-1976.
TERREL BARNEY WARREN, *Professor of Architecture, Emeritus,* 1964-1976.
THOMAS BRUCE WATERS, *Professor of Philosophy, Emeritus,* 1962-1972.
HOLMES ANDREW WEBB, *Professor of Education, Emeritus,* 1960-1970.
JAMES ROY WELLS, *Secretary, Emeritus, Board of Regents,* 1951-1971.

GEORGE ARTHUR WHETSTONE, *Professor of Civil Engineering, Emeritus,* 1946-1977.
WILLIAM ELMER WHITTINGTON, *Professor of Business Administration, Emeritus,* 1947-1975.
IRA LAWSON WILLIAMS, *Professor of Agricultural Engineering, Emeritus,* 1952-1974.
BILLIE FRANCES WILLIAMSON, *Assistant Dean and Professor of Home Economics Education, Emeritus,* 1956-1973.
WILLIE MAE WOLFE, *Associate Professor of Home Management, Emeritus,* 1955-1976.
PAUL JOSEPH WOODS, *Professor of History, Emeritus,* 1960-1983.
HORACE EUGENE WOODWARD, JR., *Professor of Mathematics, Emeritus,* 1936-1977.
RUTH COWART WRIGHT, *Associate Professor of Political Science, Emeritus,* 1957-1983.
WARREN WATSON YOCUM, *Professor of Horticulture, Emeritus,* 1937-1963.
ARTHUR WESLEY YOUNG, *Professor of Agronomy, Emeritus,* 1935-1969.

*On leave 1983-84.
**On leave fall 1983.

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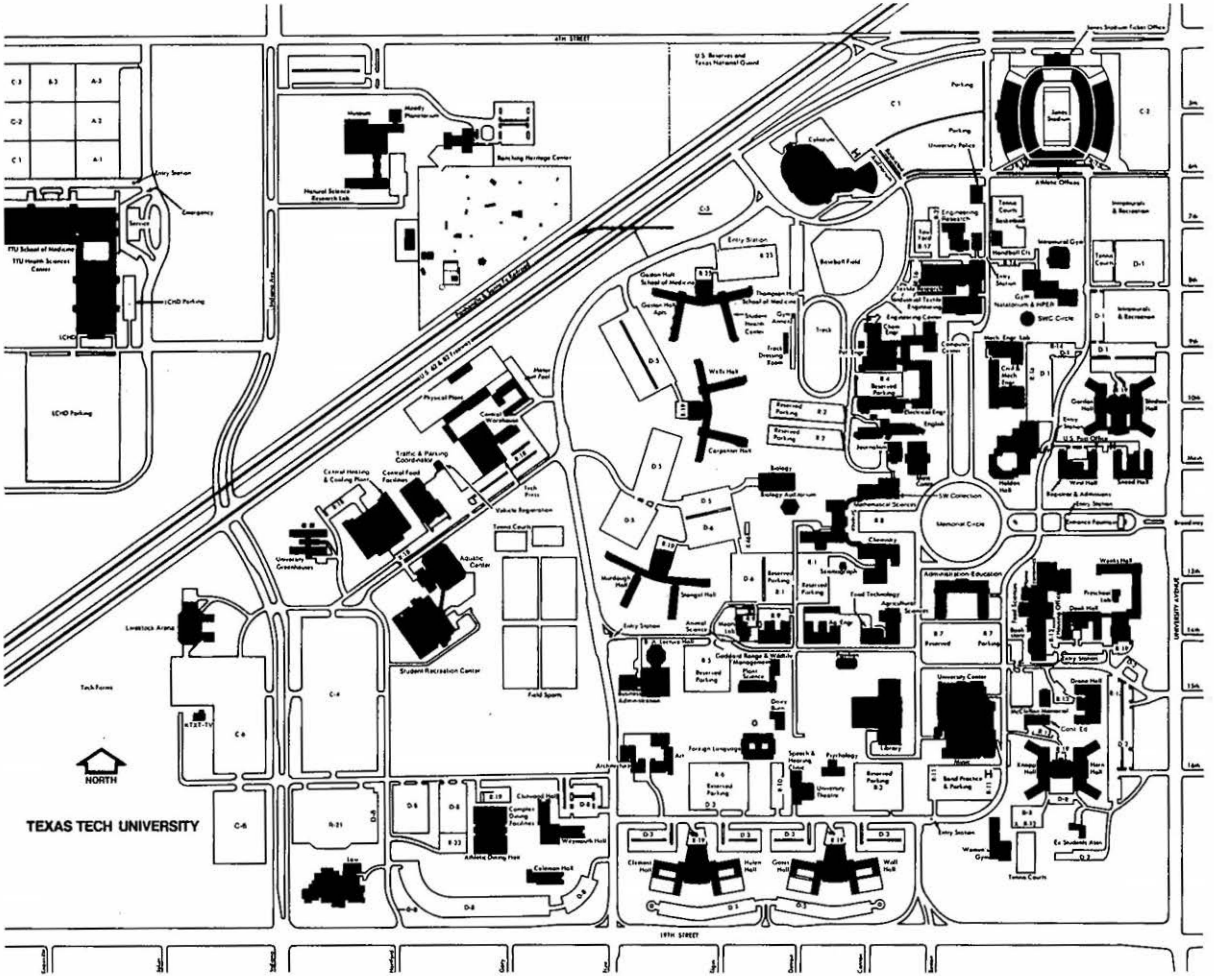
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