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Undergraduate Catalog
1991-92



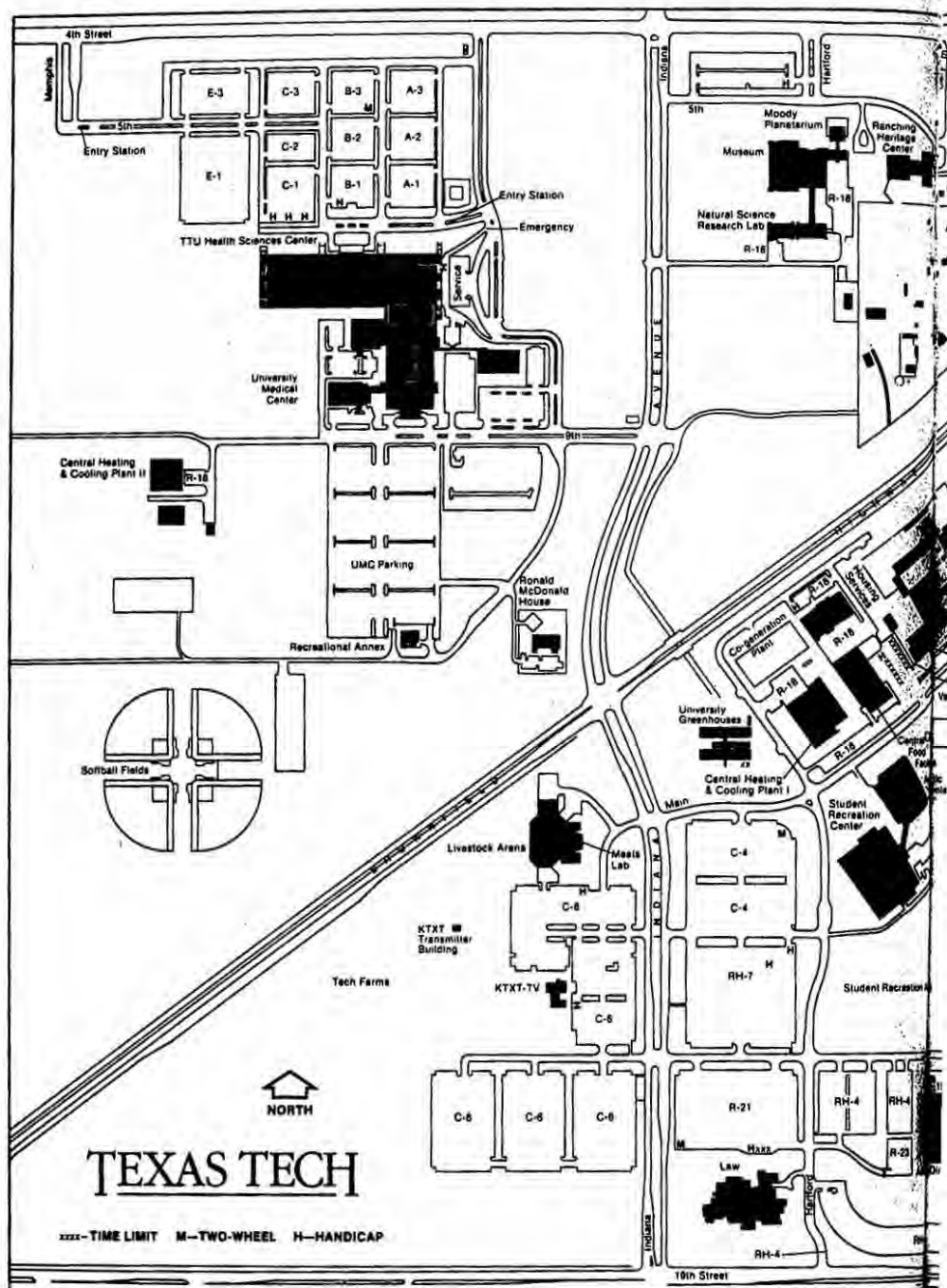
Since the programs, policies, statements, fees, and/or courses contained herein are subject to continuous review and evaluation, the University reserves the right to make changes at any time without notice. This publication is therefore intended for information only.

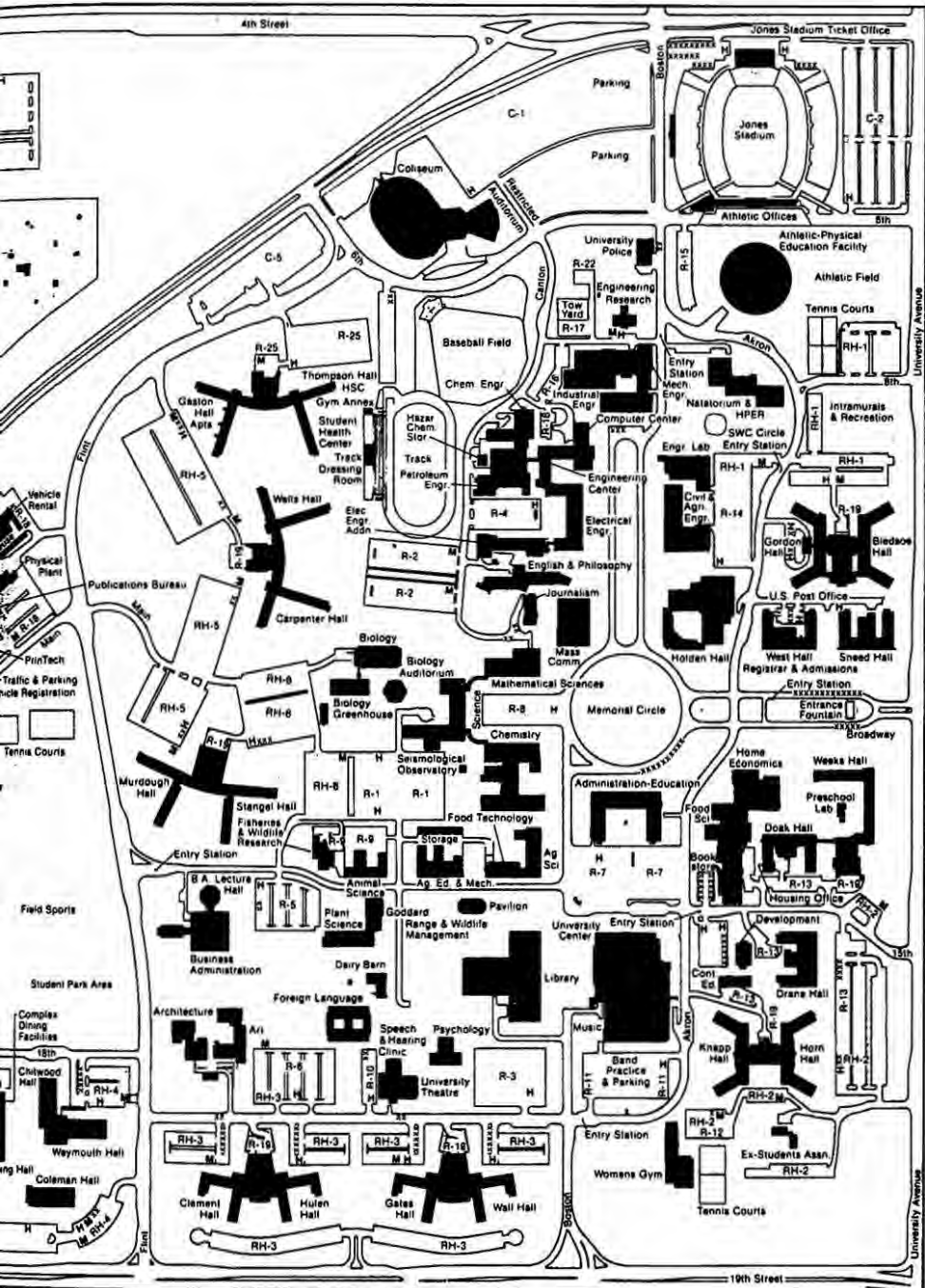
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University Calendar

Summer 1991

Interession at Junction

May 9-24, Thursday-Friday

Classes held at Junction Center campus for Interession.

First Term

June 2, Sunday

10 a.m., residence halls open for occupancy.

June 3, Monday

Registration for new students. Last day to register without penalty. First meal, breakfast, served in residence halls.

June 4, Tuesday

Classes begin.

June 4-7, Tuesday-Friday

Student-initiated drop-add.

June 7, Friday

Last day to drop a course and be eligible for a refund.

June 19, Wednesday

Last day to declare pass-fail intentions. Last day to drop a course. Last day to receive grade of W for courses dropped.

July 4, Thursday

Independence Day. University holiday.

July 5, Friday

Last day to withdraw from the University.

July 11, Thursday

Last day of classes.

July 12-13, Friday-Saturday

Final examinations for the first term.

July 13, Saturday

First summer term ends.

July 14, Sunday

Students without room reservations for the second term must vacate residence hall rooms by 10 a.m.

July 16, Tuesday

9 a.m., final grade rolls due in the Registrar's Office.

Second Term

July 15, Monday

10 a.m., residence halls open to new occupants. Registration for new students.

July 16, Tuesday

Classes begin.

July 16-19, Tuesday-Friday

Student-initiated drop-add.

July 19, Friday

Last day to drop a course and be eligible for a refund.

July 30, Tuesday

Last day to declare pass-fail intentions. Last day to drop a course. Last day to receive grade of W for courses dropped.

August 9, Friday

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 15, Thursday

Last day of classes.

August 16-17, Friday-Saturday

Final examinations for the second term.

August 17, Saturday

Last meal served in residence halls Saturday evening. Second summer term ends.

August 18, Sunday

10 a.m., residence halls close.

August 20, Tuesday

4 p.m., final grade rolls due in the Registrar's Office.

Fall 1991

August 25, Sunday

10 a.m., residence halls open for occupancy.

August 26, Monday

Faculty on duty.

August 26-30, Monday-Friday

Registration for new students.

August 29, Thursday

First meal, breakfast, served in residence halls.

August 30, Friday

Last day to register without penalty.

September 2, Monday

Labor day. University holiday.

September 3, Tuesday

Classes begin.

September 3-6, Tuesday-Friday

Student-initiated drop-add.

September 18, Wednesday

Last day to drop a course and be eligible for a refund.

September 30, Monday

Last day for December 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.

October 14, Monday

Last day to declare pass-fail intentions. Last day to receive grade of W for courses dropped.

October 28, Monday

5 p.m., midsemester grade rolls due in the Registrar's Office. Last day to drop a course. Last day for December degree candidates and faculty to order invitations and academic regalia at the Bookstore.

November 11-26, Monday-Tuesday

Advance registration (currently enrolled students) for spring semester.

November 26, Tuesday

Last day to withdraw from the University. Last day for December degree candidates to remove grades of I and PR and to complete final examinations in correspondence courses. 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.

November 27, Wednesday

Noon, classes dismissed for Thanksgiving holidays.

December 2, Monday

Classes resume. Open registration begins.

December 5-11, Thursday-Wednesday

Period of no examinations except for make-up exams or scheduled lab exams.

December 11, Wednesday

Last day of classes.

8 Calendar

December 12, Thursday

Individual Study Day.

December 13-18, Friday-Wednesday

Final examinations for fall semester.

December 18, Wednesday

Fall semester ends.

December 19, Thursday

Last meal, breakfast, served in residence halls. 10 a.m., residence halls close. Noon, grade rolls for graduating students due in the Registrar's Office.

December 20, Friday

4 p.m., final grade rolls due in the Registrar's Office.

December 21, Saturday

Commencement. Degree candidates may occupy rooms until noon.

Spring 1992

January 13, Monday

10 a.m., residence halls open for occupancy.

Faculty on duty.

January 13-17, Monday-Friday

Registration for new students.

January 17, Friday

First meal, breakfast, served in residence halls.

Last day to register without penalty.

January 20, Monday

Classes begin.

January 20-23, Monday-Thursday

Student-initiated drop-add.

February 4, Tuesday

Last day to drop a course and be eligible for a refund.

February 14, Friday

Last day for May 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.

February 28, Friday

Last day to declare pass-fail intentions. Last day to receive grade W for courses dropped.

March 13, Friday

Last day to drop a course. Last day for May degree candidates and faculty to order invitations and academic regalia at the Bookstore. 5 p.m., midsemester grade rolls due in the Registrar's Office.

March 14, Saturday

Noon, classes dismissed for spring vacation.

March 23, Monday

Classes resume.

April 6-22, Monday-Wednesday

Advance registration (currently enrolled students) for summer and fall.

April 20, Monday

Day of no classes.

April 23, Thursday

Open registration begins. Last day to withdraw from the University. Last day for May degree candidates to remove grades of I and PR and to complete final examinations in correspondence courses. 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.

April 30-May 6, Thursday-Wednesday

Period of no examinations except for make-up exams or scheduled lab exams.

May 6, Wednesday

Last day of classes.

May 7, Thursday

Individual Study Day.

May 8-13, Friday-Wednesday

Final examinations for the spring semester.

May 13, Wednesday

Spring semester ends.

May 14, Thursday

Last meal, breakfast, served in residence halls. 10 a.m., residence halls close. Degree candidates may occupy rooms until noon, Saturday, May 16. Noon, grade rolls for graduating students due in the Registrar's Office.

May 16, Saturday

Commencement.

May 18, Monday

Noon, final grade rolls due in the Registrar's Office.

1991

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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* (viewbook), *Scholarships and Financial Aid*, *Graduate Catalog*, *Law School Catalog*, *Independent Study by Correspondence Catalog*, and *Faculty Handbook*. The *Student Affairs Handbook* 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 the Dean of Students' Office, (806) 742-2192.

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 programming, technical assistance in modifying course requirements, testing procedures and campus facilities, and referral to a variety of campus resources. Accessible housing and transportation,

handicap parking, wheelchair sports and adaptive recreation opportunities, financial assistance, counseling, and student support groups are also provided.

The deadline for application for services is normally 30 days prior to the beginning of the initial semester of enrollment, to allow time to provide adequate coordination of services. The deadline for application for subsequent continuous semesters of enrollment is two weeks prior to registration.

A 504 student grievance procedure administered through the Dean of Students' Office is available.

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.

The Texas Commission for the Blind has several vocational rehabilitation programs of educational assistance for blind and visually impaired students at Texas Tech, in those instances in which the disability constitutes a substantial handicap to employment. For detailed information concerning these programs, contact the TCB counselor, 3rd floor, TTU Library, (806) 742-2253.

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

Nearly 25,000 students attend classes in Lubbock on the 1,839-acre University campus. The University also operates the Research Center-East Campus (Lubbock); Texas Tech University Center at Amarillo, an educational facility and agricultural research farm of approximately 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 over 194,000, 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 degrees coupled with the average noon humidity of 46 percent 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." Architecture became a college in 1986.

Texas Tech was first accredited by the Southern Association of Colleges and Schools in 1928 and has been continuously since that time.

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 1989 the enrollment was 25,027.

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 (1980-1988). Robert W. Lawless became President on July 1, 1989.

Financial Support

The University receives the major share of its educational and general operating funds from appropriations by the legislature. For the construction

and renovation of academic and general buildings, funds are made available from the Higher Education Assistance Fund (HEAF), 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 a 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 an Executive Vice President and Provost who oversees the educational programs and administrative support functions of the University; a Vice President for Development who oversees fund-raising activities; a Vice President for Fiscal Affairs who is responsible for all the fiscal operations of the University; a Vice President and General Counsel who provides guidance on legal matters; a Vice President for Governmental Relations who maintains liaison with the Legislature, officers of the state government, and other state agencies; and a Vice President for Student Affairs who is concerned with the general welfare of the students of the University.

Texas Tech consists of the following colleges and schools: the College of Agricultural Sciences, the College of Architecture, 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 resource for agricultural research and education, adding strength, flexibility, and prestige to the academic programs at Texas Tech.

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 Llano River in the Texas Hill Country.

The campus area of the center consists of two academic buildings, a large lecture hall and dining area, four classroom and living quarter study areas, a two-story laboratory and faculty housing unit, and two combination seminar and housing units. Within these structures are twelve classrooms, four wetlabs, a darkroom, a library, and offices. The campus also contains an art complex 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 for groups of 20 or more.

The center offers regular, full-credit undergraduate and graduate courses in intensive format over three-week periods during May through July. These courses ordinarily include art, biology, botany, zoology, entomology, range and wildlife management, geology, geography, photography, education, and physical education. 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 researchers. 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.

Information about courses and activities may be obtained from the Office of the Vice Provost for Academic Affairs.

Office of International Affairs. 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 Office of International Affairs provides information, counseling, and advisement to international students on all noncurricular issues including immigration regulations, financial issues, personal concerns, and general American academic questions. The office also coordinates cross-cultural programming and other extracurricular activities with campus- and community-based organizations to facilitate development of cross-cultural understanding. The Office of International Affairs offers customized services to sponsoring agencies and students. Services to sponsoring agencies include monitoring of placement, customized billing procedures, timely reports, special program design, and maintenance of communications. Special counseling and advising, orientation and administrative services are provided to sponsored students. An administrative fee of \$200 per semester and \$100 per summer term attended is charged for sponsored students.

Overseas Resource Center. A period of time spent studying abroad is one of the most effective means of increasing one's understanding of other peoples and cultures, improving one's ability to speak other languages, studying the problems and approaches to problems that are specific to other areas of the world, and gaining a new understanding of one's own society and culture. Many of the foreign language departments of the University regularly sponsor overseas summer programs for their students; other departments offer overseas programs occasionally.

The Overseas Resource Center, located in the Office of International Affairs (242 West Hall), coordinates reciprocal student exchanges with universities in France, Japan, and Mexico. In addition, the center is the Texas Tech coordinating

office for the International Student Exchange Program (ISEP). These types of exchanges allow qualified Texas Tech students to exchange places with students from other countries for a year or a semester and to receive credit for their academic work. The cost of these exchanges is usually much less than that of many other education abroad programs.

The center coordinates the London Semester Program offered by the Texas London Consortium. Through this program, students register for credit courses on their home campuses. The courses are taught in London by faculty members selected from universities participating in the consortium.

Students may also study in Denmark through Denmark's International Study Program (DIS). This program offers qualified English-speaking undergraduates an opportunity to study the arts, humanities, social sciences, international business, and architecture in Denmark. Courses are taught in English by Danish professors. Texas Tech University is one of a select group of U.S. institutions that co-sponsors the program, and applications are handled through the center. Students should contact the Overseas Opportunities Counselor for information on reciprocal student exchanges, ISEP, DIS, and the London Semester Program.

In addition to coordinating programs, the center maintains a reference library of catalogs and announcements of overseas educational programs. These programs include those offered by Texas Tech University departments as well as those sponsored by other institutions. The staff of the center helps students clarify their objectives for overseas study and assists them in identifying educationally sound programs. Students may also receive guidance in applying for their chosen programs. Students who wish to study overseas are advised to begin planning at least a year in advance of their departure date.

ICASALS. The International Center for Arid and Semiarid Land Studies (ICASALS) was created in 1966 to promote the University's special mission—the interdisciplinary study of arid and semiarid 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 semiarid areas. ICASALS brings together the sciences, technologies, humanities, and arts, with those regions where low productivity and low rainfall significantly affect the inhabitants and economies involved. ICASALS serves as a contracting unit of the University for international development programs.

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 semiarid 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 profes-

sional 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.

Museum. The Museum of Texas Tech University is located on the campus at 4th Street and Indiana. Its mission is to collect, preserve, interpret, and disseminate knowledge about natural and cultural material from the Southwest and other regions related by natural history, heritage, and climate.

The building, completed in 1970, contains over 120,000 square feet of galleries, research facilities, classrooms, work areas, and storage space. The Museum complex includes the main museum building, planetarium, Natural Science Research Laboratory, Cotton Heritage Center, Lubbock Lake Landmark, and a 92-acre natural science and archaeological site in Val Verde County. 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, an 82-seat auditorium with a Spitz A4 projector, has daily programs for the public. These programs are at 2 p.m. Tuesday through Friday, 7:30 p.m. Thursday evening, and 2 and 3:30 p.m. 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 10 a.m. to 5 p.m., Tuesday through Saturday (Thursday evening until 8:30 p.m.), and from 1 to 5 p.m. Sunday. The Museum is closed Monday.

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 10 a.m. to 5 p.m. and Sunday from 1 to 5 p.m.

Libraries. The libraries—in all their constituent parts—identify, acquire, describe, organize, preserve, interpret, and disseminate information in many different formats and by various available means. The libraries are the primary repository of information on campus and are the basis for classroom instruction, scholarly and scientific research, and individual development.

The libraries contain 1.1 million volumes, over 9,000 periodical subscriptions, and approximately 650,000 units of microform. The collection provides materials in the humanities, social sciences, and sciences and is organized according to the Library of Congress classification system. The government documents collection is one of two Regional Depositories for U.S. Government Documents in Texas and contains over 885,000 items. It covers almost all subject areas with special strengths in Congressional information, U.S. census data,

federal laws and regulations, and statistics. Reference librarians staff the General Reference desk and the Government Documents Reference desk to assist in accessing the libraries' collections. As a member of an international database, the University Library has access to over 19,000,000 titles.

The Southwest Collection, housed in the Mathematics Building, is both the University archives and a regional depository for historical information pertaining to West Texas and the near Southwest.

Many library functions are automated, including cataloging, circulation, and interlibrary loan. Computer Assisted Search Service, which accesses more than 400 online bibliographic indexes, is also available.

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 and Risk Management 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 should be made through the Contracting and Risk Management Office.

Athletic Facilities and Programs. As a member of the National Collegiate Athletic Association and the Southwest Athletic Conference, Texas Tech provides intercollegiate athletic programs for men and women. Both programs operate under NCAA and SWC rules and regulations as well as under the auspices of the Texas Tech Athletic Council whose membership represents the faculty, the student body, the Ex-Students' Association, and one member-at-large appointed by the President. Athletic activities are organized under the Director of Athletics with head coaches in each of the sports responsible to the director.

Women athletes currently compete in intercollegiate volleyball, cross country, basketball, golf, tennis, and track and field. The program has grown rapidly since 1974 with teams participating in state, regional, and national

competitions. The men's program includes football, basketball, cross country, track, baseball, golf, and tennis.

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. Renovations have expanded seating to the present capacity of 47,000 seats. In the spring of 1988, the playing field was resurfaced with state-of-the-art Astroturf in time for the 88-89 football season. Athletic Department offices in the south end of the stadium underwent refurbishing in 1988.

Baseball games are played at Dan Law Field where a new \$300,000 lighting system permits nighttime use for the added enjoyment of both athletes and fans.

Track events are held at the R.P. "Bob" Fuller Track, and basketball games tip off in the Municipal Coliseum, located on the north edge of the campus near Jones Stadium. The Coliseum, which seats 8,176, is operated by the City of Lubbock and rented by the University for its events.

During inclement weather, Texas Tech athletes can practice in the new Athletic Training Center, located just south of Jones Stadium. The facility contains over 3 million cubic feet of space, making it the largest full-circle membrane structure in the world for use by people. All sports may prepare for competition in the two-level complex. One of its main features is an artificial turf football field that can be rolled out to a maximum length of 60 yards. A full-sized wooden basketball court, four tennis or volleyball courts, nets for baseball pitching and hitting baseball and golf balls, a 250-yard long circular track with six lanes, and a 5,500-square-foot weight room are other features of this versatile facility.

International Center for Textile Research and Development. The International Center for Textile Research and Development has a continuing history of service in aiding the fiber and textile interests of Texas. Its scope 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; and research on fabric finishes for specific purposes, such as flame resistance.

The objectives of the center are to conduct research that will lead to greater use 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.

The International Center participates in the University's academic programs. The laboratories are used by undergraduate students studying Textile Technology and Management and by graduate students working toward a master's degree in Interdisciplinary Studies. The combination of research and academic programs has created considerable interest in the center, both domestically and internationally.

Additional activities conducted by the center include special schools, conferences, and seminars. The three-week Texas International Cotton School is held twice each year. Three-day conferences for cotton seed companies and week-long seminars for textile manufacturers bring hundreds of participants to the campus of Texas Tech University. More than four thousand individuals visit the International Center annually.

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. Many departments also provide computing resources for their constituents to use.

Academic Computing Services (ACS) operates the Advanced Technology Learning Center (ATLC) with about 150 microcomputer and terminal work stations. ACS also operates and maintains a large, interactive academic computing system (DEC VAXcluster) with a wide selection of software. An extensive Ethernet-based network—TTUnet—serves most campus academic buildings with connections to the VAXcluster and major national networks (e.g., Internet, NSFnet, THEnet, and Bitnet [CREN]). In the ATLC, VAX and IBM terminals are located in an open-access setting. There are also micro labs available for faculty and student use, including two Macintosh labs, a Faculty Development lab, a Zenith PC lab, and a Graphics lab. A bulletin board system (MicroTechNet) is available to provide access to public domain and shareware software for microcomputer systems. The ATLC has a Teleconference Room, which can be used for shortcourses or video training, as well as incoming satellite teleconferences.

A Help Desk with trained personnel provides assistance for the VAXcluster, two IBM 3081s, and the micro labs. Assistance in the use of statistical software and other programming assistance is offered as a service to all users. User guides supplement programming assistance, and documentation may be purchased or obtained through on-line sources. ACS offers a continuing series of shortcourses and other computer training, and there is a wide selection of software which may be checked out for use in the ATLC. Plotting and varied print services are also available. Application forms for computing account numbers (DEC VAX) may be obtained at the ATLC.

University Computing Facilities (UCF) maintains and operates two IBM 3081 VM and MVS systems with a wide selection of software, as well as a communications—TechNet—for use with these systems. Terminals are located throughout the campus. Application forms for computing account numbers (IBM) may be obtained at the Computer Center. Plotting, optical scanning, and varied printing services are also available 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 Risk Management.

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 and KOHM (FM). KTXT-FM and KOHM are University-owned radio stations managed by the School of Mass Communications. KTXT-FM

operates on a frequency of 88.1 mhz with a power of 18,500 watts (ERP) and provides a service of music, news, and special programs of interest to the campus community. It also provides a channel of communication within the Texas Tech community and from the University to the Lubbock community. Managed by a faculty director and staffed by Texas Tech students, station facilities are also used by students enrolled in telecommunications courses. KOHM operates on a frequency of 89.1 mhz with a power of 20,000 watts (ERP). It provides classical music and fine arts programming to the South Plains.

KTXT-TV. A noncommercial educational television station, KTXT-TV (Channel Five) is licensed by the Federal Communications Commission to the University's Board of Regents and is operated by the Division of Continuing Education's Educational Television Department. The broadcast operation is part of a telecommunications service center that includes a seven-channel cable system, capable of feeding instructional television programming to classrooms throughout the campus, and a multiterminal telecommunications receive-only earth station, providing the University's principal access to communications satellites.

Channel Five's office, studio, production, master-control, transmitter and engineering facilities, and its 817-foot antenna-tower are located on the southwestern campus triangle, west of Indiana Avenue. From this location the station broadcasts approximately 110 hours (throughout most of the year) of very diverse programming each week. The signal coverage zone (encompassing the geographical area within a 60-mile radius of Lubbock) contains a population of approximately 380,000.

KTXT-TV is a member of the Public Broadcasting Service (PBS), a non-commercial network of 334 television stations interconnected by satellite. The station is staffed by professional personnel who produce many of the programs it broadcasts. They also produce programming to satisfy nonbroadcasting needs of the University and the community. Such work is greatly facilitated by a mobile production van.

Much of the station's regular programming is used in the University's classroom instruction. In addition, the station purchases, produces, or otherwise acquires instructional television series (that have been designed as college-credit courses or as less formal noncredit courses) and broadcasts them on special schedules as a bonus service to the University and Channel 5's South Plains viewers.

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. These plays are presented in the University Theatre, which seats 395 patrons in a comfortable, continental arrangement.

A program of student-written and student-directed productions is presented in the Laboratory Theatre. In addition, a repertory season including musical plays is presented each summer in collaboration with the School of Music. 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 Research Center. The Department of Human Development and Family Studies in the College of Home Economics operates a Child Development Research Center which offers morning and afternoon programs

for children from birth to 6 years old. These laboratories provide varied opportunities for University students to acquire information and skills regarding the development and guidance of young children. The CDRC research components include investigations of child behavior, family interaction, 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 Research Center Office, Department of Human Development and Family Studies.

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 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 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 shuttle bus service from 5 p.m. 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.

Speech-Language and Hearing Clinic. The Speech-Language and Hearing Clinic, with facilities on the north side of the University Theatre Building, serves as a practicum site for students in the Department of Speech and Hearing Sciences. Under faculty supervision, students in speech-language pathology and audiology provide clinical services for the students, faculty, and staff of Texas Tech University and other residents of West Texas and eastern New Mexico. Assessment services and therapy are available for children and adults with hearing problems or disorders in language, voice, stuttering, or articulation. A sliding fee scale is available for those who qualify. Individuals are accepted by self-referral and upon referral from other professionals. Anyone needing these services should contact the Speech-Language and Hearing Clinic Office, Room 257 in the Foreign Language Building, or call 742-3907.

Transcript Service. Copies of a student's transcript are available upon written request to the Registrar's Office. Adequate advance notice, normally one week, is required for transcript processing. Cost is \$2 per copy, payable in advance. Contact the Registrar's Office, Box 4570, Texas Tech University, Lubbock, Texas 79409.

Transcripts furnished from other institutions become the property of Texas Tech University.

Official transcripts may be withheld from a student who has an administrative flag on his or her record until the flag has been released. For information about administrative flags and the status of flags on students' records, refer to the section on "Administrative Flags" in this catalog.

Recreational Sports. The Department of Recreational Sports serves the leisure needs of Texas Tech students through its eight main divisions: intramurals, open recreation, sport clubs, aquatics, clinics and classes, special events, fitness, 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, water ski, aikido, kendo, racquetball, rodeo, 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 clinic and class program includes noncredit instruction in weight training, racquetball, squash, tennis, and other recreation-related activities. Fitness activities include a wide range of aerobics, fitness testing, individual analysis, and exercise prescription.

The special event program includes weekend tournaments, fun runs, triathlons, international olympics, and various other wild and zany recreational activities. Information on special rules and dates of activities can be obtained from the office on the upper level of the Student Recreation Center.

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 Services Office.

Texas Rehabilitation Commission. Vocational rehabilitation has several programs of educational assistance for disabled students at Texas Tech, in those instances in which the disability constitutes a substantial handicap to employment.

For detailed information concerning these programs, contact the TRC counselor, Room 118 West Hall, (806) 742-1430.

University Police Services. This branch of physical plant operations is under the supervision of the Associate Vice President for Physical Plant and Support 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 National Association of State Universities and Land Grant Colleges.

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 and Extension Classes. At the request of an institution, organization, or a sufficient number of persons, off-campus classes (residence and extension) may be organized. Both graduate and undergraduate courses may be offered off campus.

Registration fees for extension courses vary. All fees must be paid in advance and are not refundable after the first class meeting. Students wishing to drop an extension 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.) The academic credit earned by completing an extension course is equivalent to the credit earned through a residence course. Extension courses have the same course prefix, number, and title and provide the same semester hours of credit as respective resident courses.

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).

A limited number of courses providing residence credit are offered off campus by some departments. Normal residence registration fees may apply to such courses. Requests to have credit courses offered off campus should be submitted as far in advance as possible.

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 also 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.

High School Level Correspondence Courses. Courses offering high school credit are available in the following fields: agriculture, anthropology, business education, computer science, consumer and homemaking education, economics, English and language arts, fine arts, foreign languages, health, history, journalism, mathematics, physical education, psychology, science, sociology, and social studies. 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 \$69 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 \$39 per semester hour. A Texas Tech student must take the final examination at least 30 days before the date the grade is needed on the transcript.

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 take that course (or a degree-plan alternate) by correspondence if approval is granted by the student's academic dean.

The following college courses are taught by correspondence:

College of Agricultural Sciences

Agricultural Science (AGSC)

1111. The Agricultural Industry

Agricultural Economics (AECO)

2306. Principles of Marketing

Agricultural Products

3302. Agricultural Finance

Agronomy (AGRO)

4335. Soil Fertility Management

College of Arts and Sciences

Anthropology (ANTH)

2302. Cultural Anthropology

Economics (ECO)

2301, 2302. Principles of Economics

English (ENGL)

0301. Essentials of English Usage

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

4341. Teaching English in

Secondary Schools

Geography (GEOG)

2351. Regional Geography of the
World

Health, Physical Education, and Recreation

Health (HLTH)

1306. Health in the Marketplace

3311. Communicable and Chronic
Diseases

3325. Health Concerns in Chemical
Dependencies

Recreation (REC)

3301. The Process of Recreation
Programming

4308. Managing Leisure Service
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

3338. History of Sports and
Recreation in the U.S.

3382. Modern Latin America

Mass Communications (MCOM)

1300. Introduction to Mass
Communications

Journalism (JOUR)

3350. History of American
Journalism

Public Relations (P R)

3310. Principles of Public Relations

Telecommunications (TELE)

3310. Introduction to
Telecommunications

Mathematics (MATH)

0302. Intermediate Algebra

1320. College Algebra

1321. Trigonometry

1330, 1331. Introductory
Mathematical Analysis

1350. Analytical Geometry

1351. Calculus I

1352. Calculus II

2300. Statistical Methods

2350. Calculus III

Music Theory (M TH)

2403. Intermediate Theory

2404. Intermediate Theory

Philosophy (PHIL)

2300. Beginning Philosophy

2310. Logic

Political Science (POLS)

1301. American Government,
Organization

2302. American Public Policy

Psychology (PSY)

- 1300. General Psychology
- 2301. Child Psychology
- 2302. Mental Health
- 2305. Adolescent Psychology
- 3304. Introduction to Social Psychology
- 3306. Personality
- 3403. Statistical Methods in Psychology
- 4300. Psychology of Human Sexual Behavior
- 4305. Abnormal Psychology

Sociology (SOC)

- 1301. Introduction to Sociology
- 1320. Current Social Problems

Speech and Hearing Sciences (SHS)

- 5323. Language Development

College of Business
Administration
Accounting (ACCT)

- 2300. Elementary Accounting I
- 2301. Elementary Accounting II

Business Law (BLAW)

- 3391. Business Law I
- 3392. Business Law II

Finance (FIN)

- 3320. Corporation Finance I
- 3323. Principles of Money, Banking, and Credit
- 3332. Real Estate Fundamentals
- 3334. Real Estate Finance
- 4324. Investments
- 4335. Real Estate Investment Analysis

Information Systems and Quantitative Sciences (ISQS)

- 2445. Introduction to Business Statistics

Management (MGT)

- 3373. Managerial Communication

Marketing (MKT)

- 3350. Introduction to Marketing

College of Education
Educational Instructional Technology (EDIT)

- 5318. Introduction to Small Computers in Education

Educational Psychology (EPSY)

- 4357-014. Guidance Studies IV/ Human Relations and Reality Therapy

- 4357-015. Guidance Studies IV/ Stress Management

- 5369-014. Seminar in Counseling/ Reality Therapy and Control Therapy

- 5369-015. Seminar in Counseling/ Stress Management

- 5369-016. Seminar in Counseling/ CHOICE Program

Elementary Education (EDEL)

- 4350. Children's Literature

Secondary Education (EDSE)

- 3100. Substitute Teaching (Section 1)

- 3100. Improving Student Behavior (Section 2)

College of Home Economics
Family Studies (F S)

- 2322. Courtship and Marriage

Human Development (H D)

- 2303. Life Span Human Development

- 3314. Development in Later Childhood

Interior Design (I D)

- 1380. Introduction to Housing and Interiors

Restaurant, Hotel, and Institutional Management (RHIM)

- 2308. Hotel Operations

- 2312. World's Wines and Spiritous Beverages

Special Activities. Division staff members offer assistance in developing and facilitating noncredit conferences, institutes, workshops, and seminars as well as community short courses and training programs. Over 180 such programs including review courses for the LSAT, MCAT, GMAT, and GRE 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.

Students seeking degrees are admitted to a specific college within Texas Tech University. Colleges within the University may set various requirements in addition to the general University minimum requirement for continuance in certain degree programs.

Unconditional Admission. To be admitted unconditionally for the first time to Texas Tech, an applicant must have graduated from an accredited high school with required credits and must have made an acceptable score on either the Scholastic Aptitude Test (SAT) or the American College Test (ACT) as indicated below. Students who graduated and have been out of high school more than five years are not required to provide test scores. The University will admit all students who hold bona fide scholarships awarded by an official Texas Tech University scholarship committee.

The following table shows the high school subjects and credits (in units) required for unconditional admission to the University.

High School Subjects	Units Required
English	4
*Mathematics	3
Social Science	2-1/2
†Laboratory Science	2
**Foreign Language	2
††Electives	3-1/2

*The colleges of Architecture and Engineering require geometry, trigonometry, and algebra II; the College of Business Administration requires algebra II.

†The College of Architecture requires chemistry or physics; the College of Engineering requires chemistry and physics.

**Beginning in the fall of 1991, the general education requirement at Texas Tech includes foreign language, unless students have completed two units of a single foreign language at the high school level.

††It is strongly recommended that at least two elective units be chosen from computer science, economics, mathematics beyond algebra I, public speaking and debate, science, and social science.

Conditional Admission. Applicants admitted without having qualified under the "Unconditional Admission" guidelines noted above may be expected to take specific courses during the first two semesters of enrollment and must follow prescribed advising procedures and seek counseling assistance from their academic dean.

Probationary Admission. Applicants admitted as probationary students must pass 12 semester hours of college courses with a grade-point average of 2.0 or higher prior to their initial fall enrollment. One course must be in mathematics or English and at least one other must satisfy a state or University basic requirement. Remedial courses (numbered 0301 or 0302) may be used to meet up to 6 hours of this requirement. Probationary students are eligible to enroll during the spring semester provided they have not earned less than a 2.0 GPA at another college or university. Probationary students must follow advising

and counseling procedures as prescribed by their academic dean during the first term of their attendance at the University. In addition, their academic progress will be monitored in the first semester of their regular admission. NOTE: The 12 hours can be taken at another college or university. Students entering the College of Architecture, College of Business Administration, College of Home Economics, or School of Mass Communications must have a 2.5 GPA. Students entering Chemical Engineering must have a 2.6 GPA.

The following table shows the high school graduating class rank and minimum test scores required for probational, conditional, and unconditional admission to the University.

Admission Classifications

Effective Fall 1991

Test Scores			Rank In High School Class				
ACT	ACT [†]	SAT	Top 10%	Next 15%	Second Quarter	Third Quarter	Fourth Quarter
			UNCONDITIONAL				
28	29	1200					
26	27	1100	CONDITIONAL				
24	25	1000					
21	22	900	PROBATIONARY				
18	20	800					
15	18	700					

[†] Enhanced ACT scores for tests taken on or after October 28, 1989.

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 and should include the student's senior year courses. Tentative admission can then be granted pending graduation from high school. 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.

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.

Texas Academic Skills Program (TASP). The Texas State Education Code requires that all students who enter public institutions of higher education must complete the TASP test for assessment of college-level reading, writing, and mathematics skills. This applies to new freshmen and transfer students, including nondegree students in certificate programs of over 9 credit hours.

The test must be taken prior to the end of the term in which 9 or more college credit hours will be accumulated. For transfer students, the test must be taken before the end of the first semester at a public institution.

Performance on the test will not be used as a condition of admission. However, students in Texas are encouraged to take the test before arrival at Texas Tech to facilitate proper placement in their first semester courses. The test may be taken once the student has passed the 11th grade TEAMS test and received an official notice of admission to college.

Registration booklets are available through Texas high school counselors or through public college and university TASP offices. The test fee will be paid by the student.

Orientation and Early Registration Conferences. Eleven orientation and early registration conferences are scheduled throughout the summer. Eight are for entering freshmen and three are designed specifically with the transfer student in mind. The two-day programs include opportunities for academic advisement, early registration, and an introduction to the University and the campus environment.

All incoming students who have been formally admitted to the University will receive conference invitations and are encouraged to attend. Traditionally,

more than 5,000 students and their parents participate annually in the summer orientation conferences. On-campus housing is available to all participants and their guests for a minimal charge. Optional programs presented during each conference include campus tours, social activities, and seminars focusing on campus activities, residence life, financial aid, and individual interests.

Questions regarding the conferences may be addressed to the Dean of Students' Office in West Hall, (806) 742-2126.

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. (This includes permanent residents of the United States as well as transfer students.) 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 \$10,880 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 \$122 per semester hour. In addition, an administrative fee of \$200 per semester and \$100 per summer term completed will be charged for certain sponsored students.

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 including repeated courses for which a student has enrolled are used in computing the grade-point average. Students should refer to the appropriate college section for any specific requirements.

A student who has fewer than 12 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 only as transient students need not submit transcripts but must provide a letter of good standing from the last institution attended and documentation of their TASP status.

Admission of Former Texas Tech Students. Former students of the University who have not attended Texas Tech during either the fall or spring semester are required to complete an application for readmission. The application should reach the Office of Admissions and Records at least 30 days prior to regular registration for the semester the student plans to attend. Students on suspension from Texas Tech University must apply for readmission at least 60 days prior to the beginning of the semester they plan to attend. Students returning from first suspension will be required to take XL-0001, "Strategies for Success," during the first semester of their readmission. A fee of \$85 will be collected for this course.

A former student of the University who has afterward attended another institution will be considered as a transfer student and should be aware that the entire academic record (Texas Tech and all other college work) will be used in determining readmission.

Students returning from suspension may apply for readmission to the college from which they were suspended or to another college if they have decided upon a different major or career goal.

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). (Master's programs in business require the GMAT.) 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. Such students must apply at least 45 days prior to the beginning of the semester. Such students would also be required to take the Non High School Graduate Test, registration for which is made through the Admissions Office.

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.

In the event that credit for a course completed at another college or university is not acceptable, both the student and the other institution will be notified in writing of the denial. The two institutions and the student will then attempt to resolve the transfer of course credit in accordance with certain rules and guidelines. If the transfer dispute is not resolved to the satisfaction of the student or the institution at which the credit was earned within 45 days after the date the student received written notice of the denial, Texas Tech will notify the Commissioner of the Texas Higher Education Coordinating Board of its denial and the reason for the denial. The Commissioner or his designee will make the final determination about a dispute concerning the transfer of course credit and give written notice of the determination to the student and the institutions involved.

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 will be considered as a transfer student and will be required to meet the standards for such students.

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. Any current or former Texas Tech student (or prospective student) may attempt to earn credit by examination for any undergraduate course provided the student has neither passed nor failed that course at Texas Tech. 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 Center, 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 freshman 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.

7. In cooperation with and in compliance with federal nondiscrimination laws and policies, credit by examination is open to all persons. Students with mostly A and B grades who have higher admission test scores are encouraged to consider attempting credit by examination.

Credit earned will be awarded after the student has completed 12 credit hours in residence at Texas Tech.

There are five 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), (4) departmental examinations prepared, administered, and scored by faculty

members who teach the related course, and (5) credit for an International Baccalaureate (IB) examination.

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 Center 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 Center 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 Center of Texas Tech University, Box 4160, Lubbock, Texas 79409.

4. Credit by Departmental Examination. Any current or former Texas Tech student (or prospective student) may attempt to earn credit by examination for any undergraduate course provided the student has neither passed nor failed that course at Texas Tech. 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.
<i>Biology</i>			
BIOL 1401, 1402	CEEB APP: Biology	3	8
BIOL 1401, 1402	CLEP-S: Biology	49	8
<i>Business Administration</i>			
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
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
<i>Chemistry</i>			
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
<i>Computer Science</i>			
C S 1300	CLEP-S: Computer and Data Processing	47	3
C S 1301	CEEB APP: Computer Science A	3	3
C S 1302	CLEP-S: Elementary Computer Programming: Fortran IV	50	3
C S 1362, 1102	CEEB APP: Computer Science A	3	4
C S 1362, 1102, 2363, 2103	CEEB APP: Computer Science AB	3	8
<i>Economics</i>			
ECO 2301, 2302	CLEP-S: Introductory Micro- and Macro-economics	48	6
<i>Education</i>			
EPSY 3330	CLEP-S: Educational Psychology	47	3
<i>English</i>			
ENGL 1301	CPT Achievement Test: English Composition	550	3
ENGL 1301, 1302	CPT 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

TTU Courses for which credit can be earned	Standardized Test(s) Used	Min. Score	TTU Sem. Hrs.
<i>English (cont.)</i>			
ENGL 1301, 1302	ACT: English Aptitude	28	6
ENGL 1301, 1302	ACT: Composite Aptitude	28	6
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
<i>French</i>			
FREN 2301	CEEB APP: French Literature	2	3
FREN 2301, 2302	CEEB APP: French Literature	4	6
<i>German</i>			
GERM 2301	CEEB APP: German	2	3
GERM 2301, 2302	CEEB APP: German	4	6
<i>History</i>			
HIST 1300, 1301	CEEB APP: European History	3	6
HIST 1300	CLEP-S: Western Civilization I	50	3
HIST 1301	CLEP-S: Western Civilization II	50	3
HIST 2300	CPT Achievement Test: American History-Social Studies	550	3
HIST 2300, 2301	CEEB APP: American History	3	6
HIST 2300, 2301	CPT Achievement Test: American History-Social Studies	650	6
HIST 2300	CLEP-S: American History I	50	3
HIST 2301	CLEP-S: American History II	50	3
<i>Mathematics</i>			
MATH 1320	CLEP-S: College Algebra	50	3
MATH 1321	CLEP-S: Trigonometry	49	3
MATH 1350	CPT Achievement Test: Mathematics Level I or II	650	3
MATH 1350, 1351	CEEB APP: Calculus AB or Calculus BC	3	6
MATH 1350, 1351	CLEP-S: Calculus with Elementary Functions (no calculators)	45	6
MATH 1350, 1351, 1352	CEEB APP: Calculus AB or Calculus BC	4	9
MATH 1350, 1351, 1352	CLEP-S: Calculus with Elementary Functions (no calculators)	50	9
<i>Physics</i>			
PHYS 1306, 1307 & 1103, 1104	CEEB APP: Physics B	3	8
PHYS 1308, 1105	CEEB APP: Physics C	3	4
<i>Political Science</i>			
POLS 1301	CLEP-S: American Government	47	3
<i>Psychology</i>			
PSY 1300	CLEP-S: General Psychology	50	3
PSY 2301	CLEP-S: Human Growth and Development	50	3
<i>Spanish</i>			
SPAN 2301	CEEB APP: Spanish	2	3
SPAN 2301, 2302	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

CPT = College Placement Test — Achievement Tests

5. Credit for an International Baccalaureate (IB) Examination. The International Baccalaureate is an international program of courses and examinations. To receive University credit, students who have taken the IB examination must submit their IB grade and test score and a copy of the final examination paper. After reviewing these materials, the student's academic dean will determine the appropriate amount of credit and/or advanced placement allowed.

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.

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.

Stop Registration. A student may be denied registration if he or she has an administrative flag of that type on his or her record. For information about administrative flags and status of flags on students' records, refer to the section on Administrative Flags under "Academic Information" in this catalog.

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

Change of Schedule. With proper approval, students who wish to request a change in schedule may do so. All student-initiated schedule changes will be assessed a processing fee according to the existing fee schedule. 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.

Finances

The principal business offices of the University are those of the Vice President for Fiscal Affairs, Associate Vice President for Business Affairs and Comptroller, Assistant Vice President for Budget and Investments, and the Assistant Vice President for Financial Services.

The Vice President for Fiscal Affairs is the executive in charge of all fiscal operations of the University.

The Associate Vice President for Business Affairs and Comptroller oversees the operations of the offices of Accounting Services, Contracting, Purchasing-Payables, and Bursar and is responsible for collecting, depositing, and disbursing all funds received by the University. The collections and deposits are handled by the Bursar and staff.

The Assistant Vice President for Budget and Investments provides support in the development and execution of the University's budgets and financial plans. Payroll is in the area of responsibility of the Assistant Vice President for Financial Services.

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	\$300	\$300
Laboratory Fees	30	30
Building Use Fee	90	90
Student Services Fee	82	82
Medical Services Fee	25	25
University Center Fee	20	20
Computer Access Fee	45	45
ID Card Fee	2	2
General Property Deposit (new student)	10	
Books and Incidentals (estimated)	150	150
Total	\$754	\$744

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.

Fees and Deposits

Fee Payment. *Student registration is not complete and enrollment is not official until payment is made on tuition and fees. Tuition and fees may be paid using one of the following options:*

Option 1: Payment of the total amount due;

Option 2: Payment of one-half of the amount due initially, one-fourth before the sixth class week, and the final one-fourth before the eleventh class week. FAILURE TO MAKE AN INITIAL PAYMENT BY THE DUE DATE WILL RESULT IN THE CANCELLATION OF THE REGISTRATION. FAILURE TO MAKE PAYMENTS UNDER THE INSTALLMENT PAYMENT PLAN WILL RESULT IN ADDITION OF LATE CHARGES. A STUDENT WHO FAILS TO MAKE FULL PAYMENT OF TUITION AND FEES, INCLUDING ANY INCIDENTAL FEES, BY THE DUE DATE MAY BE PROHIBITED FROM REGISTERING FOR CLASSES UNTIL FULL PAYMENT IS MADE. A STUDENT WHO FAILS TO MAKE FULL PAYMENT PRIOR TO THE END OF THE SEMESTER MAY BE DENIED CREDIT FOR THE WORK DONE THAT SEMESTER. FAILURE TO MAKE ANY PAYMENT PRIOR TO THE TWELFTH CLASS DAY WILL RESULT IN CANCELLATION OF THE REGISTRATION. ANY STUDENT REGISTERING OR REREGISTERING AFTER THE TWELFTH CLASS DAY WILL BE CHARGED A \$70 PER CREDIT HOUR FEE IN ADDITION TO TUITION AND OTHER FEES.

It is the student's responsibility to insure that payment is received in the Bursar's Office by the University-established due dates announced each semester.

Students who choose to pay by installments shall be charged an installment option fee of 1.5% of the unpaid balance in addition to the amount of the payment due. The total amount of the installment including the installment option fee must be received on the due date announced in order for the student to continue in good standing.

For students who register within the designated preregistration dates for the semester or summer term, bills will be mailed and payment must be made on or before the stated due date. Students who register after the designated preregistration dates for the semester or summer term will not be mailed a bill and these students must pay at the Bursar's Office by the University-established due date for the semester or summer term.

A late payment penalty of \$15 per billing (maximum \$75 per semester) will be charged the third working day following the University-established due dates.

Students permitted to register after classes begin will be charged a late registration fee of \$15. A student permitted to register and/or pay after the twelfth class day of a semester or the fourth class day of a summer term will be assessed a reinstatement fee of \$70 per semester credit hour. This fee is in addition to the late registration fee and the late payment fee. The amount of reinstatement fee is subject to change by action of the Board of Regents without prior notice.

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.

Payments by mail may be made by Visa, MasterCard, Discover card or 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 charges set forth herein by action of the Board of Regents of Texas Tech University or the Texas State Legislature as the case may be.

Tuition Fees. *Tuition Fee for Resident Students Other than the School of Law.* For legal resident students of the state of Texas, the tuition fee, each semester, is \$20 per semester hour, but the total of such charge shall not be less than \$100.

Tuition Fee for Nonresident Students Other than the School of Law. For non-resident students the tuition fee, each semester, is \$122 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. Please refer to the last item of this section for a glossary that explains the terms used in residency interpretation.*

Rules and Regulations for Determining Residence Status Pursuant to Title 3, Texas Education Code, Effective Fall 1989.

GENERAL RESIDENCY RULES

Minors and Dependents

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.

Residence of a Minor or a Dependent: Divorce of Parents. The legal residence of a minor or dependent child is usually that of the parent with whom the individual spends the principal amount of time. Upon divorce of parents, residency of a minor is based on the residence of the parent who has legal custody or has claimed the minor for federal income tax purposes both at the time of enrollment and for the tax year preceding enrollment. For dependents over 18, residency is determined by the residence of the parent who claims the student for federal income tax purposes both at the time of enrollment and for the tax year preceding enrollment.

Custody by Court Order. If the custody of a minor has been granted by court order (e.g., divorce decree, child custody action, guardianship or adoption proceedings) to some person other than the parent, the residence of that person shall control; provided, however, that such grant of custody was not ordered during or within a year prior to the minor's enrollment in a public institution of higher education and was granted under circumstances indicating that such guardianship was not for the purpose of obtaining status as a resident student.

If the minor is not residing with either parent, and there is no court-appointed guardian, the residence of the parent with whom the minor last resided shall be presumed to control. If, however, the minor resided with and has been dependent upon a grandparent for more than a year prior to enrollment in a public institution of higher

education, the residence of that natural guardian will be regarded as the minor's 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 a minor.

Abandoned Child. In the case of an abandoned child, the residence of a person who has 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 the minor, and the minor must have actually resided in the home of such person for two years immediately prior to enrolling in a public institution of higher education in Texas and such person must have provided substantially all of the minor's 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 shall be considered residents of Texas provided they remain in Texas from the time of such graduation until they enter an institution of higher education.

Emancipation. 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 not dependent on their parents, minors may establish emancipation. If emancipation is clearly proved, the residence classification of the 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. (See Reclassification). Proof of emancipation is the responsibility of the minor.

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.

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 Texas Education Code 54.055, the minors shall 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 reenroll 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 parents are still claiming legal residence in the State of Texas and that they have the present intent to return to the state. A certificate from the employer of the parents that the move outside the state was temporary (generally less than five years) and that there are definite plans to return the parents to Texas by a determinable future date will 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 re-establish 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 Texas Higher Education Coordinating Board. 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.

Section 54.052(h) An individual who has come from outside Texas and registered in an educational institution before having resided in Texas for a 12-month period immediately preceding the date of registration is entitled to pay the tuition fee and other fees required of Texas residents if the individual or a member of his family has located in Texas as an employee of a business or organization that became established in this state as part of the program of state economic development and diversification authorized by the constitution and laws of this state and if the individual files with the Texas institution of higher education at which he registers a letter of intent to establish residency 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 a public institution of higher education 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. Students enrolling in an institution of higher education prior to having resided in the state for 12 months immediately preceding time of enrollment will be classified as nonresidents for tuition purposes.

Dependents over 18. For dependents over 18, residency is determined by the parent who claims the student for federal income tax purposes both at the time of enrollment and for the tax year prior to enrollment.

Re-establishment 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, shall be classified as residents. The parent(s) of dependents must return to the state to live in order for the minor or the dependent to be considered a resident.

Reclassification. Persons classified as nonresident students upon first enrollment in a public 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 re-entry into an institution of higher education they will be entitled to be reclassified as residents for tuition purposes. Accumulations of summer and other vacation periods do not satisfy this requirement. Reclassification to resident status after residing in the state for 12 months cannot be based solely upon the student's or the student's spouse's 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 enrolling in the institution, the fact of full-time employment and the nature of such employment while a student, purchase of a homestead with substantial down payment, or dependency upon a parent or guardian who has resided in Texas for at least 12 months immediately preceding the student's enrollment. All of these facts are weighed in the 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. Students classified as nonresident students shall 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. Application for reclassification must be submitted prior to the official census date of the relevant term.

Loss of Residence. Persons who have been attending Texas public institutions of higher education as residents and who move out of state will be classified as nonresidents immediately upon leaving the state unless their move is temporary (generally less than five years) and residence has not been established elsewhere. Conclusive evidence must be provided by the individuals supporting their present intent to return to the state. Among other things, a certificate from the employer that the move outside the state is temporary and that a definite future date has been determined for return to Texas may qualify as proof of the temporary nature of the time spent out of state. Internship programs as part of the academic curriculum that require the student to return to the school may qualify as proof of the temporary nature of the time spent out of state.

Economic Development and Diversification Employees. An individual who has come from outside Texas and registered in an educational institution before having resided in Texas for a 12-month period immediately preceding the date of registration and his dependents are entitled to pay the tuition fee and other fees required of Texas residents if the individual has located in Texas as an employee of a business or organization that became established in this state as part of the program of State Economic Development and Diversification authorized by the constitution and laws of this state and if the individual files with the Texas institution of higher education at which he registers a letter of intent to establish residency in Texas.

Married Students

Statute: Section 54.056 A student who is a resident of Texas and who marries a nonresident is entitled to pay the resident tuition fee as long as the student does not adopt the legal residence of the spouse in another state.

Marriage of a Texas resident to a nonresident does not jeopardize the former's right to pay the resident tuition rate unless the resident has taken steps to claim the residence of his or her spouse. A nonresident who marries a resident must establish his or her own residency by meeting the standard requirements. (See "Individuals Over 18")

Foreign Students

Statute: Section 54.057(a) 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.

Section 54.057(b) A nonimmigrant alien who resides in this state in accordance with the Agreement between the Parties to the North Atlantic Treaty Regarding the Status of Their Forces (4 U.S.T. 1792) and the spouse or children of such an alien are residents for tuition and fee purposes under this code.

Aliens living in the United States under a visa permitting permanent residence, and aliens who are permitted by Congress to adopt the United States as their domicile while they are in this country, have the same privilege of qualifying for Texas resident status for tuition purposes as do citizens of the United States.

(NOTE: Only a permanent resident may file with the federal immigration authorities a declaration of intention to become a citizen. Generally, individuals who enter the state under a student or tourist visa and who obtain permanent resident status while in Texas must wait a minimum of 12 months from the date of issue to request status for tuition purposes.)

NATO Forces Stationed in Texas. Nonresident aliens stationed in Texas in keeping with the agreement between the parties to the North Atlantic Treaty regarding status of forces, their spouses, and dependent children are entitled to pay the same tuition rate at public institutions of higher education as residents of Texas.

EXCEPTIONS TO BASIC RESIDENCY RULES

Military Personnel and Veterans

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

Section 54.058(b) A person who is an officer, enlisted person, selectee, or draftee of the Army, Army Reserve, Army National Guard, Air National 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 and the spouse and children of such an officer, enlisted person, selectee, or draftee are entitled to register 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 the officer, enlisted person, selectee, or draftee has been assigned to duty or resided in the state. However, out-of-state Army National Guard or Air National Guard members attending training with Texas Army or Air National Guard units 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 Reserves 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 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.

Section 54.058(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 the fees or charges provided for Texas residents.

Section 54.058(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.

Section 54.058(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.

Section 54.058(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. Texas Education Code 54.058(b) provides that military personnel assigned to duty within the State of Texas, their spouse

and their dependent children, shall 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 resident tuition, such military personnel shall submit at the time of each enrollment 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 enrollment in a public 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.

Spouse and Children of Members of Armed Services. Texas Education Code 54.058(c) provides that if they reside continuously in the state of Texas, the spouse and dependent children of members of the armed forces assigned to duty outside the state of Texas may pay resident tuition rates while the spouse or parent is on his/her first assignment subsequent to assignment in Texas. In order for the dependent child to qualify, a parent must also continuously reside in Texas.

Texas Education Code 54.058(g) provides that the spouse 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 public 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.

Texas Education Code 54.058(f) provides that members of the immediate family (which includes spouse or dependent children) of members of the armed forces who die 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 shall 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 Texas Education Code 54.058(b), (c), (f), and (g) are classified as nonresidents but shall 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 this subchapter.

Nonresidents Attending College Under Federal Benefits Programs for Veterans. Texas Education Code 54.058(e) provides that the public 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 which 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 which 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 permanent address with the military 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, and membership in professional or other state organizations. 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. Additionally a terminal duty assignment in Texas in which an individual has engaged in personal, business and/or professional activities indicative of their intent to remain in the state will be given more consideration than most other evidence presented.

Residence Classification of Veterans Upon Separation from Military Service. Persons who enroll in a public institution of higher education following separation from military service must be classified as nonresident students unless (A) they were legal residents of Texas at the time of entry into military service and have not relinquished that residence, (B) they can prove that during military service they have, in fact, established bona fide, legal residence in Texas at least 12 months prior to enrollment, or (C) they have resided in Texas other than as students for 12 months prior to enrollment 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. (See Residence of Individuals Over 18).

Students Enrolled in ROTC Programs. A nonresident student who is a member of an ROTC unit will be required to pay nonresident tuition rates until such time the student has signed a contract which cannot be terminated by the student and which obligates the student to serve a period of active military duty.

Teachers, Professors and Their Dependents

Statute: Section 54.059 A teacher or professor of an institution of higher education, and the spouse and children of such a teacher or professor, are entitled to register in an 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 the teacher or professor has resided in Texas. A teacher or professor of an institution of higher education and the teacher's or professor's family are entitled to the benefit of this section if the teacher or professor is employed at least one-half time on a regular monthly salary basis by an institution of higher education.

Teachers and professors employed at least half time on a regular monthly salary basis (not hourly employees) by any Texas public institution of higher education with an effective date of employment on the official census date of the relevant term(s), 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, such employees must submit, prior to the time of each enrollment, a statement certifying employment from the director of personnel or a designated representative of the public institution of higher education by which he or she is employed.

Teaching or Research Assistants

Statute: Section 54.063 A teaching assistant or research assistant of any institution of higher education and the spouse and children of such a teaching assistant or research assistant are entitled to register in a state institution of higher education by paying the tuition fees and other fees or charges required for Texas residents under Section 54.051 of this code, without regard to the length of time the assistant has resided in Texas, if the assistant is employed at least one-half time in a teaching or research assistant position which relates to the assistant's degree program under rules and regulations established by the employer institution.

Teaching or research assistants 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 official census date of the relevant term(s), may pay the same tuition while attending the employing institution as a resident of Texas for themselves, their spouses, and their dependent children, regardless of the length of residence in the state. The institution which employs the students shall determine whether or not the students' jobs relate to their degree programs.

Competitive Academic Scholarship Recipients

Statute: Section 54.064(a) A student who holds a competitive academic scholarship of at least \$200 for the academic year or summer for which the student 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 the student has resided in Texas. The student must compete with other students, including Texas residents, for the academic scholarship and the scholarship must be awarded by a scholarship committee officially recognized by the administration and be approved by the Texas Higher Education Coordinating Board under criteria developed by the board.

54.064(b) Beginning with the 1989-1990 academic year, the total number of students at an institution paying resident tuition under this section for a particular semester may not exceed five percent of the total number of students registered at the institution for the same semester of the preceding academic year.

Statute: Section 54.065 A student is entitled to pay the fees and charges required of Texas residents without regard to the length of time the student has resided in Texas if the student: (1) holds a competitive academic scholarship or stipend; (2) is accepted in a clinical and biomedical research training program designed to lead to both doctor of medicine and doctor of philosophy degrees; and (3) is either a nonresident or a citizen of a country other than the United States of America.

To qualify for exemption from paying out-of-state tuition rates a student must be awarded a competitive academic scholarship in the amount of \$200 or more for the academic year, the summer session or both by an official scholarship committee or committees of the public institution of higher education which they are attending. If nonresidents or foreign students in competition with other students, including Texas residents, obtain these competitive academic scholarships, the students may pay the same tuition as a resident of Texas during the registration period in which the competitive academic scholarship is in effect. A competitive academic scholarship that qualifies the holder for waiver of the difference between the tuition charged to resident and nonresident students shall be awarded for the purpose of encouraging academic excellence in the academic program in which the student is enrolled.

Effective in the 1989-90 academic year an institution shall not waive nonresident tuition on the basis of competitive academic scholarships for more than five percent of its total enrollment in the corresponding semester or term of the previous academic year.

A nonresident or foreign student is eligible to pay the fees and charges required of Texas residents if the student holds a competitive academic scholarship or stipend and is accepted in a clinical biomedical research training program designed to lead to both a doctor of medicine and doctor of philosophy degree.

SPECIAL PROGRAMS

Bordering State or Nation

Statute: Section 54.060(a) 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.

Section 54.060(b) The foreign student tuition fee prescribed in this chapter does not apply to a foreign student who is a resident of a nation situated adjacent to Texas, who registers in any general academic teaching institution, as defined in Section 61.003(3) of this code, in a county immediately adjacent to the nation in which the foreign student resides, and who demonstrates a financial need after the financial resources of the foreign

student and the student's family are considered. The foreign student described in this section shall pay tuition equal to that charged Texas residents under Sections 54.051 and 54.0512 of this code.

Residents of a State Bordering Texas. 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 of the United States 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 section shall 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) which 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.

Citizens of Mexico. A citizen of Mexico who registers for instruction offered by a general academic teaching institution in a county bordering Mexico is eligible to pay tuition equal to that charged Texas residents provided the student demonstrates a financial need after the resources of the student and the student's family have been considered.

Ad Valorem Tax Payers

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 that is subject to ad valorem taxation by the junior college district. Persons applying for such waiver shall 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 presentation of a deed, property closing statement, or other appropriate evidence of ownership of property which is subject to ad valorem taxation by the junior college district. If a sworn affidavit is accepted at the time of enrollment, verification of the student as an ad valorem taxpayer must be provided by the end of the semester of enrollment.

A foreign student is not eligible for waiver of the nonresident tuition rate due to payment of ad valorem taxes.

RESPONSIBILITIES OF STUDENTS AND SCHOOLS

Student Responsibilities

Statute: Section 54.0521(a) Oath of Residency. Before an individual may register at an institution of higher education paying tuition at the rate provided for residents, the individual must affirm under oath to the appropriate official at the institution that the individual is entitled to be classified as a resident for purposes of tuition.

Section 54.0521(b) If the institution later determines that the individual was not entitled to be classified as a resident at the time of the individual's registration, the individual shall, not later than 30 days after the date the individual is notified of the determination, pay to the institution the amount the individual should have paid as a nonresident.

Section 54.0521(c) If the individual fails to make a timely payment as required by this section, the individual is not entitled to receive a transcript or to receive credit for courses taken during the time the individual was falsely registered as a resident student.

Oath of Residency. The student is responsible for registering under the proper residence classification and for providing documentation as required by the public institution of higher education. If there is any question as to right to classification as a

resident of Texas it is the student's obligation, prior to or at the time of enrollment, to raise the question with the administrative officials of the institution in which they are enrolling for official determination. Students classified as Texas residents must affirm the correctness of that classification as a part of the admissions procedure. If the student's classification as a resident becomes inappropriate for any reason, it is the responsibility of the student to notify the proper administrative officials at the institution. Failure to notify the institution constitutes a violation of the oath of residency and will result in disciplinary action.

Responsibilities of the Public Institutions of Higher Education

Review of Enrollment and/or Registration Forms. Each public institution of higher education is responsible for reviewing enrollment and/or registration applications for errors, inconsistencies or misclassifications of residency status. Institutions should obtain written documentation to resolve any problems noted during the review of forms.

Oath of Residency. Each public institution is responsible for incorporating an oath of residency into its student application for admission. Substantiating documentation may be required by the institution to affirm Texas residency.

PROCEDURES FOR RECLASSIFICATION

Application for Reclassification. Students classified as nonresident students shall 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. An application for reclassification must be submitted prior to the official census date of the relevant term.

Reclassification as a Nonresident. Persons who have been classified as residents of Texas shall be reclassified as nonresident students whenever they shall 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 shall be reclassified as nonresidents and shall be required to pay the difference between resident and nonresident fees for those semesters in which they were so erroneously classified. In addition, the students shall be required to pay back all monies borrowed from the Hinson-Hazlewood College Student Loan Program.

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 shall be reclassified as residents of Texas and may be entitled to a refund of the difference between the resident and nonresident fees for the semesters in which they were so erroneously classified. Normally the refunds must be requested and substantiated during the current term.

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 Texas Higher Education Coordinating Board 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.

GLOSSARY

Conclusive evidence. Proof which removes uncertainties. In the case of proving residency, conclusive evidence may include but is not limited to the purchase of a homestead with substantial down-payment, significant employment, dependence on parents who are residents of the state, and business or personal ties in the state which imply a fixed intent to remain in Texas.

Dependent child. An individual (minor or over 18 years of age) who is claimed as a dependent for federal income tax purposes by a parent or guardian the year of enrollment and the tax year prior to enrollment.

Foreign students. Aliens who are not permanent residents of the United States or have not been permitted by Congress to adopt the United States as their domicile while they are in this country.

In-district student. A Texas resident who physically resides within the geographic boundaries of the classifying public junior college district.

Minor. An individual who is 17 years of age or younger.

Nonresident. A citizen, national or permanent resident of the United States or an alien who has been permitted by Congress to adopt the United States as his or her domicile while in this country and who has not met the state requirements for establishing residency for tuition purposes.

Official census date. The official reporting date for enrollments; the date upon which the student (by virtue of having paid or obligated him/herself to pay requisite tuition and/or fees) is considered to be enrolled in the institution. (For 16-week semesters, the 12th class day; for 6-week summer sessions, the 4th class day.) For other length programs, consult the *Reporting and Procedures Manual*, published by the Educational Information Center of the Coordinating Board.

Out-of-district student. A Texas resident who does not physically reside within the geographic boundaries of the classifying public junior college district.

Prior to enrolling. Prior to or including the official census date.

Public institution of higher education. State-supported institutions of higher education, including public, junior and community colleges, public senior colleges and universities, public health science centers and Texas State Technical Institutes.

Resident. A citizen, national or permanent resident of the United States, or an alien who has been permitted by Congress to adopt the United States as his or her domicile while in this country, and who has otherwise met the state requirements for establishing residency for tuition purposes.

Time of enrollment. Official census date for the semester or term for that institution. (For specific dates, refer to the *Reporting and Procedures Manual* of the Educational Information Center of the Coordinating Board.)

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:

Perkins-National Direct Student Loan

Hinson-Hazlewood College Student Loan

Stafford Loans

College Work-Study Program

Supplemental Educational Opportunity Grants

Pell 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 completed by April 15 for the fall semester, by October 1 for the spring semester, and by March 1 for the summer session. Applications completed 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.

Federal regulations require that all financial aid recipients are maintaining satisfactory academic progress. According to the standards and practices at Texas Tech University, effective July 1, 1989, the following guidelines will be applied in determining satisfactory progress.

All undergraduate and law student aid recipients must have a 2.00 cumulative grade-point average (GPA) and for graduate students, a 3.00 cumulative GPA.

If the student's cumulative GPA falls below 2.00 (Graduate—3.00), the student will be given one semester probation.

If a student earns a 2.00 GPA (G—3.00) during a semester he or she is on probation but fails to raise the cumulative GPA to a 2.00 (G—3.00) or better, he or she will continue on probation as long as the current GPA of 2.00 (G—3.00) is maintained and until such time as his or her cumulative GPA meets the requirements.

If at the end of any probationary semester the student does not have a 2.00 (G—3.00) current or cumulative GPA, the student will not receive future financial aid until a 2.00 (G—3.00) cumulative GPA has been obtained.

All students enrolling at Texas Tech for the first time (including transfers) will not be denied aid based on their enrollment status. However, all financial aid recipients must meet the requirements for satisfactory progress to continue on aid.

In addition to maintaining the overall GPA, a student must be making reasonable academic progress. Therefore, after completion of 60 hours attempted, a student must have earned at least 75 percent of all hours attempted at Texas Tech to remain on financial aid.

After an undergraduate student has completed 144 hours, he or she will have to be approved by the Financial Aid Office to receive additional financial

aid. Approval will be given on a semester basis. A student who is working on a second degree will be allowed an additional 48 hours.

Full-time graduate students will be eligible to receive aid for six semesters. Part-time students are extended proportionately. Semesters are based on attendance whether the student received financial aid or not.

A nondegree graduate student is eligible to receive financial aid for only a 12-month period.

Summer school is considered as a semester.

Financial aid recipients or applicants whose aid has been cancelled or denied as a result of failure to meet the required standards may be reinstated under the following conditions:

- a. a student must regain a 2.00 cumulative GPA (G—3.00)
- b. after 60 hours, a student must have completed and earned 75 percent of the hours attempted
- c. students wishing to appeal their loss of aid may do so in writing to the Financial Aid Appeals Committee. Forms are available in the Financial Aid Office. Appeals may be made under hardship based on (1) the death of a relative of the student, (2) personal injury or illness of the student, or (3) special circumstances as determined by the institution. Documentation is required (ex. death certificates or notice, medical bills, also notes from an instructor or PASS showing effort made to make up work in the course).

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. The following men and women who were legal residents of Texas at the time of entry into the Armed Forces and who have been legal residents of Texas for a period of not less than twelve months immediately preceding their registration in Texas Tech University are by state law exempt from the payment of all fees except laboratory and library fees or similar deposits and fees or charges for room and board: all nurses and honorably discharged members of the Armed Forces of the United States who served during the Spanish-American War, World War I, World War II (except those who were discharged from service because they were over the age of 38 or because of a personal request on the part of the person that he be discharged), the National Emergency which began on June 27, 1950 (also referred to as the Korean War), and all persons who were honorably discharged after service 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 Korean War). These exemptions also apply to the children of members of the United States Armed Forces who were killed in action or died while in service during World War II, the Korean War, or the Cold War, and to orphans of members of the Texas National Guard and the Texas Air National Guard killed since January 1, 1946, while on active duty.

NOTE: The exemption from fees provided for above does not apply to a person if at the time of his registration he is eligible for educational benefits under federal legislation in effect at the time of his registration.

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.

General Fees. The following fees are those scheduled to be in effect during the 1991-92 school year. They are subject to change by the University Board of Regents and/or the Texas Legislature.

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. *Laboratory Fees:* For each enrollment in a laboratory course, a fee of not less than \$2 and not more \$30 per semester is charged for each course.

3. *Medical Services Fee:* This is a \$25 fee authorized by state law to be paid each semester and each summer term for every student enrolled for 4 semester hours or more.

4. *University Center Fee:* This is a \$20 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. *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.

7. *Diploma Fee:* Graduating students will be charged a diploma fee of \$12 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 \$12, as in the initial order.

8. *Identification Card:* This is a \$2 fee to be paid each term. A fee of \$10 will be charged for card replacement and \$5 will be charged for revalidation.

9. *Duplicate Fee Receipt:* A fee of 50 cents will be charged for each duplicate fee receipt issued.

10. *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.

11. 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	\$ 6.85	Learning Center
2	13.70	KTXT-FM
3	20.55	University Daily
		Law School Student Government
		Student Organization Advisement
		Student Association
		Spirit Activities
		Health Sciences Center Student Government
		University Counseling Center
		Legal Counsel-Students
		Career Planning and Placement
		Group II**
4	27.40	All Group I Services
5	34.25	Campus Organizations
6	41.10	Texas Tech Choral Organizations
7	47.95	Texas Tech Symphony Orchestra
8	54.80	Campus Transportation System
		Group III***
9	61.65	All Group I & II Services
10	68.50	Cultural Events
11	75.35	University Theatre
		Texas Tech Band
		Group IV
12 or more	82.00	All Group I, II, & III Services
		Intercollegiate Athletics
		Recreational Services (Intramurals, Facilities, Aquatic Center, Sports Clubs)

*Students required to pay for Group I services may, at their option, elect to pay \$54.80 for Group II services, \$75.35 for Group III services, or \$82.00 for Group IV services.

**Students required to pay for Group II services may, at their option, elect to pay \$75.35 for Group III services or \$82.00 for Group IV services.

***Students required to pay for Group III services may, at their option, elect to pay \$82.00 for Group IV services.

12. Computer Access Fee: A fee of \$3 per semester credit hour (maximum \$45) will be charged to each student enrolled.

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. Change in Class Schedule Fee. Each change students make to their class schedules is subject to a \$6 charge per change. Students changing their class schedules after initial payment has been made will be billed by mail for

additional charges. Additional billings will be in accordance with payment options established by state law.

2. Music Fees for Private Instruction. Additional fees, payable at the time of registration, are charged for individual instruction in voice, piano, organ, strings, and wind instruments in the following courses in applied music: M AP 1001, 1002, 2001, 2002, 3001, 3002, 5001, 5100

(1 semester hour credit)\$15

(2 to 4 semester hours credit)\$30

3. Fee for Binding Theses and Dissertations. The charge for binding theses and dissertations is \$6 per copy, plus applicable tax; \$7.50 for architectural theses.

Refund of Fees. Any tuition and/or other fees refundable as a result of class schedule changes will be processed and mailed after 35 class days during the long semester. Full refund will be made if changes are made from the first through the twelfth class day (this does not apply if the student later withdraws from all classes). No refund is made for changes that occur after the twelfth class day of a semester or the fourth class day of a summer term.

Withdrawal. Students withdrawing officially during a semester either at their request or at the request of the University because of failure to comply with a condition upon which enrollment was approved may be eligible to receive a refund of tuition and fees. Depending on when the student withdraws, *the student will be required to pay at least the percentage of the total bill corresponding to the period of withdrawal shown in the table below.* The refund due to the student will be the amount paid in excess of the percentage amount due. If a student has paid less than the percentage due, the student will be required to pay the balance of that amount.

If a student drops classes prior to the twelfth class day of a long semester or the fourth class day of a summer term, the student will be credited with a full refund for the dropped hours. However, if the student later withdraws from the University, the dropped hours will be added back to the schedule before a withdrawal refund is calculated so that the student is charged based on the highest number of hours for which he or she was registered during the semester. Withdrawals are calculated using the schedule below:

Withdrawal	Percentage of Fees Due
Before 1st class day	None
1st five class days	20%
2nd five class days	30%
3rd five class days	50%
4th five class days	75%
21st class day or later	100%

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 30 hours of academic credit prior to the beginning of the first semester of enrollment to live on campus unless exempted by the Department of Housing and Dining Services. 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 Department of Housing and Dining

Services two weeks prior to the beginning of the first semester of enrollment. However, because of unforeseen changes in a student's circumstances due to illness or other personal reasons, some petitions are considered after the above date. Students are encouraged to discuss such developments with the Department of Housing and Dining Services at any time.

Unless it is clearly established that illness or personal reasons which were not known prior to the above date 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 for space assignments.

There are several housekeeping apartments (Gaston Hall) available on campus for single students 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 \$150 advance payment in addition to the \$60 deposit is required to retain the room reservation for fall (spring). The \$150 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 contractual 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 \$150 advance payment required to retain the room reservation for fall (spring) will apply to the room and board charge at the end of occupancy. A billing of the account is available to the student on the dates indicated for payment. A statement of account is also mailed to the permanent home address.

The 1990-91 academic year charges per student for a double room and 20 meals per week were as follows:

Non-Air-conditioned Halls:

Doak, Bledsoe, Gaston, Weeks, Wells,
Horn, Knapp, Sneed, Carpenter halls\$2,917

Air-conditioned Halls:

Wall, Gates, Hulen, Clement, Stangel,
Murdough, Gaston, Chitwood, Weymouth,
Coleman halls\$3,348

Air-conditioned Suites:

Gordon Hall \$3,468

Room and board plans that provide for 13 meals per week and 9 meals per week are also available at a reduced rate.

The rates for 1991-92 will be established by the Board of Regents and mailed to students who have signed 1991-92 residence hall agreements or who have applied for on-campus housing.

Student Affairs

Adult Learner Services. Students feeling "out of step" because of age, marital status, or commuting can seek general advisement through Adult Learner Services in the Dean of Students' Office. This program provides new student orientation, networking through a student organization, and publications to assist in the transition to the college campus. Contact the Adult Learner Coordinator in the Dean of Students' Office for more information.

Attorney for Students. 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. 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 Attorney for Students 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.

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 Center. This office, located on the third floor of West Hall, provides a number of services designed to assist all Texas Tech University students and alumni in their career development and job search efforts.

Each year, representatives from hundreds of organizations visit the campus to conduct employment interviews with graduating students. Degree candidates are strongly urged to use this service, normally beginning within one year of their graduation. In addition to an extensive on-campus interviewing program, many other employers will list specific vacancies within their organizations or ask the center for referrals of graduates seeking employment. An extensive series of workshops and seminars covering such topics as writing effective resumes, job search strategies, and interviewing techniques is offered each semester and all students are encouraged to participate. Graduating students should also take full advantage of individual career counseling, the Career Planning and Placement Library, the annual Career Information Day, and the establishment of a placement credential file.

Underclass students may participate in career exploration programs, visit with counselors to discuss career goals, use the career library, participate in Career Days, and use the computerized career guidance system-SIGI-PLUS. This is particularly helpful to students who are undecided about their career goals. The office also has a summer employment program that covers a range of opportunities.

Cultural Entertainment. Each year University Center Cultural Events, by recommendation of the Artists and Speakers Committee, presents the finest performing arts and lecture programs available. Performing arts programs range from classical to innovative music, theatre, and dance programs. The lectures involve a variety of issues and new ideas presented by leaders in their fields. Students have the opportunity to be involved with these events through attendance, residency activities (class visits, master classes, workshops), and serving on the Artists and Speakers Committee whose student members are selected by the Student Association from applications submitted in the spring.

Students wishing to become involved with the implementation of a popular arts program may wish to join the University Center Programs Fine Arts Committee. These student volunteers present everything from small hands-on arts events to the large music, dance, theatre, and visual arts events on tour. Members of the committee can be involved in the program planning, public relations, advertising, management, writing, and graphic art aspects of the committee and through this experience learn skills that, combined with their academic work, will give them an edge when they leave the University.

Dean of Students' Office. The Dean of Students' Office, in support of the overall mission of the University, promotes the following precepts:

- Students are our most valuable resource.
- Higher education has a responsibility to assist in the development of the whole person both in and out of the classroom.
- Students deserve an educational environment which provides opportunities for cognitive growth, values clarification, the exercise of good citizenship, and investigating their own educational process.

Toward this end, programs are offered to meet the needs of a diverse student body. Specialized programs for minority, disabled, returning adult, transfer, and commuter students are offered. The Dean of Students' Office is ready to provide information, advisement, counseling, and other types of assistance to Texas Tech students.

This office also administers the *Code of Student Conduct* and coordinates University withdrawals, new student orientation for freshmen and transfers, leadership training programs, student life research, Greek organization advisement, alcohol and drug education, and safety awareness.

Forensics and Dramatics. Students who meet general eligibility requirements may participate in intramural and intercollegiate debate and the full range of individual events, both public address and oral interpretation. 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 Theatre Technology. Students may participate in acting, stage makeup, costuming, lighting, scene design and construction, publicity, and other activities connected with play production. Four major productions, 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 first be directed to the appropriate college office. Questions concerning other grievance procedures may be directed to the Dean of Students' Office.

Learning Center: Programs for Academic Support Services (PASS). PASS provides students with learning assistance in the form of study skills groups, special topic workshops, individual academic skills counseling, a tutor referral service, and a self-help learning lab. (Video and audio tapes, printed materials, and computer software are available for mathematics, English, study skills, history, and other specific subject areas.) All services are free to students enrolled at Texas Tech. PASS is located in Room 205, West Hall. Hours of operation are 8 a.m.-8 p.m. Monday through Thursday, 8 a.m.-5 p.m. Friday, and 6-9 p.m. Sunday, fall and spring; 8 a.m.-6 p.m. Monday through Friday, summers.

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: University Choir, Symphonic Band, Marching Band, Jazz Ensemble, Music Theatre, and Symphony Orchestra. Students may also participate in the University Singers, Collegiate Singers, Madrigal Singers, University Civic Chorale, Court Jesters, Brass Band, Concert Bands, Jazz Bands and Combos, Brass Choir, Mixed Chamber Orchestra, Woodwind Ensemble, Guitar Ensemble, Viola Ensemble, Harp Ensemble, Flute Ensemble, Clarinet 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 School 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.

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. Students may also 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 7,000 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 Department of Housing and Dining Services two weeks preceding the school year.

Subject to verification and authorization by the Department of Housing and Dining Services, students will be given permission to live off campus provided:

1. The student resides and continues to reside in the established household of his or her parents.

2. The student presents evidence of financial hardship conditions and is living in the established household of a brother, sister, grandparent, uncle, or aunt. In the event the individual with whom the student lives changes residence, the student shall promptly notify the Department of Housing and Dining Services.

3. The student is married or single parent with dependent child(ren) residing with them.

4. The student is 21 years of age or older on or before the first day of classes of the initial semester of enrollment.

5. The student has successfully completed 30 or more semester hours of academic credit before the beginning of the initial semester of enrollment or has lived in University residence halls for two regular semesters.

6. The student is enrolled in the Graduate or Law schools.

7. The student has served in the military service as verified by a discharge certificate (DD214).

8. The student has a health problem as verified by the Student Health Service which precludes living in the residence halls.

9. The 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 Department of Housing and Dining Services 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 Conduct*. Any student wishing to move from the residence halls should consult the Residence Hall Contract for the provisions applicable to release from the contract. 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. In addition to the regular cafeteria menu, each dining room also presents a theme food line such as Italian, Mexican, Oriental, Deli-Pizza, Lite Line, or Bar-B-Que. 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 at the beginning of the academic year and terminates on August 29 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 at the end of that academic year. 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 and the Dean of Students' Office, 250 West Hall.

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 *Student Affairs Handbook* and students are expected to become thoroughly familiar with and abide by these regulations. Copies of the *Handbook* 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, state, and national governments. The SA provides many services for the students including insurance, a guide to housing in Lubbock, the *WORD* magazine, and a newcomer's guide.

The Student Senate passes legislation on issues concerning Texas Tech students. 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. Students attending the School of Medicine and the Health Sciences Center receive health care through the Family Practice Clinic in the Health Sciences Center.

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 5 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 University Medical Center Hospital from 5 p.m. to 8 a.m., Monday through Friday, and 24 hours per day on Saturday, Sunday, and clinic holidays. Students receiving care at the University Medical Center Emergency Room will receive a 20 percent discount on all charges.

Pharmacy, laboratory, and x-ray services are available. 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. A student's medical information is completely confidential and cannot be released to anyone without the student's written permission.

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. An official list of registered student organizations is published annually by the Student Organization Services Office.

The University also recognizes 25 national social fraternities and 14 national social sororities governed by coordinating councils. There are three governing councils: Interfraternity Council, Panhellenic Association, and Greek 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 Publications. *The University Daily*, the University student newspaper, is published daily, Monday through Friday. *La Ventana* is the University yearbook, published annually. *The Freshman Directory*, a freshman yearbook, is also published annually. Each of these publications is staffed with paid and volunteer personnel from the student body. The Student Publications Committee, a faculty-student committee, selects the student editors and reviews the annual budgets for both publications.

Student Recreation Center. Especially attractive is the \$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 twelve handball-racquetball courts; a squash court; three multipurpose rooms that house the martial arts, wrestling, tumbling, fencing, aerobics, indoor archery, and golf; a 280' by 115' gymnasium with five basketball courts or five tennis courts, or six volleyball courts, or twelve badminton courts, or any combination of the above; two weight areas; a punching bag room; two locker rooms with saunas; an outdoor shop; a recreational workshop; a media library; a classroom; offices; and a lounge.

University Testing and Evaluation Center. The University Testing and Evaluation Center, 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 center also offers academic testing and 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 and operated for the out-of-class activities of the campus community. The building features the outstanding Allen Theatre, a large covered courtyard, and numerous services and facilities for the use and convenience of its patrons.

The list of retail and service areas in the UC is extensive. Continued effort is expended to determine what goods and services will most benefit the campus

community and new areas are added to those available in the center continuously. Recent changes and additions include Raider Express, Texas Tech's first convenience store; High Tech, the campus computer store which features many lines of computers, peripherals, and software; the First National Bank of Lubbock branch in the building, the only such activity in a Texas college or university; and the Premier Travel agency in the northwest corner of the UC first floor.

University Center Food Service is in a period of sweeping change. The first of a series of major remodeling projects has been completed in the fast food areas. The complete fast food area is now called The Center Market. The Market Street Grill is the section that will serve snacks, beverages, breakfast, lunch, and dinner plates and sandwiches. Palermo's is the new area now serving Sicilian entrees, pizza, and a variety of ice cream and frozen yogurt specialties. Cappuccino's will offer gourmet coffees, espresso, cappuccino, and a variety of bakery items from fresh sweet rolls and muffins to custom-made cakes and pastries.

The balance of the food service units include the Courtyard Cafe, where complete breakfast and lunch choices are available in a comfortable atmosphere, and the Faculty Club, which has been remodeled and features a revamped menu. The Catering service is capable of serving the needs of a variety of events, from extravagant dinner service for hundreds to a simple refreshment break for a very small group.

The center also offers twelve meeting rooms including two ballrooms, which may be used by any registered student organization or campus department at nominal charges. The Games Room has pocket billiards, snooker, billiards, table tennis, a TV lounge, a dart area, and more than 35 electronic games. The center also offers a check cashing service, automated teller machines, a self-service postal facility, a posting area for services, housing, and for-sale notices, a second TV lounge, and office space for the Student Association.

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 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 mission of UC Programs is two-fold: while providing the Texas Tech community with entertaining and educational activities, the one-hundred 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 six committees of UC Programs, which are: Texas Tech Today, Concerts, Cultural Exchange, Films, Fine Arts, and Ideas and Issues.

Student Organization Services is a branch of the University Center Activities Office designed to meet the needs of over 300 Texas Tech student organi-

zations by providing leadership and skill workshops, event advisement for campus groups, the *Student Organization Handbook*, copying services for organizational business, graphics assistance, and a Ready Reference resource library.

The SOS Office can also assist students in contacting student organizations, their presidents, or advisors. Besides working with student groups, this office also serves as the resource for homecoming, Tech Leadership Academy, and campus spirit organizations.

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.

High Tech Computer Store. The High Tech computer store, located in the University Center east basement, provides computers, peripherals, and software from a number of major manufacturers at educational agreement discounted prices. To qualify for these discounts, customers must be classified as students, faculty, or staff. High Tech houses one of the most comprehensive computer and peripheral service departments in the area as well as a professional staff to assist in selecting equipment. High Tech is open from 9 a.m. to 5:30 p.m., weekdays.

University Counseling Center. The Counseling Center provides Texas Tech students with assistance concerning personal, academic-educational, and vocational-career matters. It also provides group experiences in the form of developmental 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 Speed Reading Program. The evening Marriage and Family Development Center is open Monday-Wednesday, 5-8 p.m. Tech-Tele-Tapes is an information tape service (742-1984). Interchange is an after-hours help line (742-3671). Both lines are open after 6 p.m. seven days a week. The Counseling Center is available to any enrolled Texas Tech student and all information and services are 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

General Education Requirements. The University established General Education requirements for all undergraduate students effective fall semester 1989. These requirements are designed to ensure breadth in all baccalaureate programs. A complete listing of basic requirements is given in the catalog section entitled "Uniform Undergraduate Degree Requirements."

Only students who entered Texas Tech for the first time in the fall 1989 or later are subject to the requirements.

Classification of Students. A student is classified according to the following: freshman, 0-30 hours completed; sophomore, 31-60; junior, 61-90; senior, 91-completion of degree requirements. 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 freshman may have remedial courses (numbered 0301 or 0302) counted as part of a full course load.

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 colleges or schools of the University: Agricultural Sciences, Architecture, 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. The student then completes an academic transfer form in the receiving dean's office. A student should have at least a 2.0 cumulative GPA on all work at Texas Tech to complete an academic transfer.

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.

Administrative Flags. By failing to meet certain obligations to the University, a student may be denied registration and/or receiving a transcript until the administrative flag is cleared.

Administrative flags may be placed on a student's record because of an outstanding debt to the University, disciplinary action, academic suspension, incomplete admission forms or test scores, etc. It is the student's responsibility to get the flag released which can be accomplished by meeting the requirements of the department placing the flag.

Status of flags on students' records for students who have attended Texas Tech since August 1983 may be obtained by using a push-button phone with touch-tone dialing and calling the Red Raider Robot, (806) 742-4325. Be ready to respond with your nine-digit social security or matriculation number and your six-digit birthdate. This service is available twenty-four hours a day.

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. 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 may be given. 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. Other information related to illness is found in the *Student Affairs Handbook* and the *Residence Halls Handbook*.

A student who is absent from classes for the observance of a religious holy day, according to the legal definition, will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence if, not later than the 15th day after the first day of the semester, the student has notified the instructor of each scheduled class that the student will be absent for a religious holy day.

This notification will be in writing and will be delivered by the student personally to the instructor of each class, with receipt of the notification

acknowledged and dated by the instructor, or by certified mail, return receipt requested, addressed to the instructor of each class.

A student who is excused under this policy may not be penalized for the absence, but the instructor may appropriately respond if the student fails to satisfactorily complete the assignment.

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.

The instructor in a course is responsible for initiating action for dishonesty or plagiarism which occurs in his or her class. In cases of convincing evidence of or admitted academic dishonesty or plagiarism, an instructor should take appropriate action. Before taking such action, however, the instructor should attempt to discuss the matter with the student. If cheating is suspected on a final exam, the instructor should submit an X grade until a reasonable attempt can be made to contact the student, preferably within one month after the end of the semester. See the section on "Academic Conduct" in the *Code of Student Conduct* for details of this policy.

1. **Cheating:** Dishonesty 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 to 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, daily reports, lab work, and 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 instructor of record determines all grades for a course. The method of determining a grade will be included in the course syllabus that is to be presented to the students at the beginning of the semester.

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 in certain instances.

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 long semester or the first twelve days of a summer term, a student may not initiate a drop unless withdrawing from the University. A grade of WF will be given when the student is required by the dean to drop a course for failure to attend the class or for other reasons.

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.

An NP is given if the student has not paid all fees by the end of the semester. If the student subsequently pays the delinquent fees, the Bursar will notify the Registrar, who will then record the academic grade earned.

Grade Appeals. A student who wishes to appeal a course grade should first consult with the course instructor, then with the department chairperson and then, if the matter is not resolved, with his or her academic dean from whom he or she can obtain copies of the grade appeals policy, procedures, and forms. A grade must be appealed within 60 days after receiving the disputed grade.

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.

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 elective 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.

A college may further restrict the pass-fail option but may not broaden it beyond elective courses.

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

Students wishing to take a course pass-fail should contact the academic dean's office of the college in which they are enrolled. 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. A grade of F received on a course taken pass-fail will be computed into the grade-point average.

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 Rolls. Full-time undergraduate students who earn a grade-point average of 4.0 during a semester are eligible for the President's Honor Roll. 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 acknowledgements, 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 are available to students in all undergraduate colleges. Interested students should consult the Director of Honors or their college advisors. Also see the section entitled "Honors Studies" in the College of Arts and Sciences.

Academic Status. Students may continue enrollment according to the regulations described below. The summer session is considered to be a semester (whether the student attends one or both summer terms).

Students are expected to maintain cumulative and current semester grade-point averages (GPAs) of 2.00 or above. Some academic programs have requirements over and above the cumulative GPA of 2.00. A student whose cumulative GPA is above 2.00 but whose current semester GPA is below 2.00 should seek advice and counsel from his or her academic dean.

Scholastic Probation. A student whose current GPA is below 2.00 and whose cumulative GPA is also below 2.00 will enter the subsequent semester on

"Scholastic Probation." Such a student may not enroll for more than 15 hours without prior approval of the academic dean. In addition, the student must continue to seek regularly scheduled advice and counsel from an academic advisor or the dean. A student will remain on Scholastic Probation as long as the cumulative GPA is below 2.00.

Scholastic Suspension. A student on Scholastic Probation whose current semester GPA falls below 2.00 will be suspended for the next semester.

Students on Scholastic Suspension may seek reinstatement after a minimum of 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. Students who are readmitted after first suspension will be required to take XL 0201, "Strategies for Success," during the first semester of their readmission. A fee of \$85 will be collected for this course. Applications for readmission should be received in the Office of Admissions at least 60 days before the beginning of the anticipated term of enrollment. Students who do not qualify for admission for the fall semester and then attend another college during the fall semester will be considered transfer students and must have a 2.0 GPA in order to be readmitted to the University.

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 Students' Office, 250 West Hall, 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 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 provision of new knowledge and skills for teachers are important functions 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.

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 will be advised on certification requirements 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.

Due to changes in state laws, teacher education at Texas Tech has recently undergone many revisions. Majors using the term "education" (e.g. elementary education, art education, home economics education) are no longer allowable under that name. Individuals will still be certified to teach elementary and secondary schools, but now they must complete noneducation majors.

Students preparing to teach in secondary schools will generally complete an academic major in Agricultural Sciences, Arts and Sciences, or Home Economics. (Additional course in professional education will be required for certification.) Students preparing to teach in elementary schools will complete a Multidisciplinary Studies major in the College of Education. Students interested in teaching composite science (certified to teach biology, chemistry, earth science, and physics) may complete a Multidisciplinary Science major in the College of Education or an academic major in one of the teaching fields. The Hearing Impairment and the Office Systems Technology and Administration programs also reside in the College of Education.

Degree and Teacher Certification Programs. Degree and teacher certification programs are two distinct programs. Freshmen or transfer students are admitted to a degree program in the College of Education that leads to a Bachelor of Science degree. Eligible students at the junior level are admitted to a teacher certification program that leads to a Texas teaching certificate. The certification program culminates with the state-mandated ExCET exams. Students must pass all appropriate ExCET exams for certification, but not for the bachelor's degree.

Admission to the Bachelor of Science Degree Program. The College of Education seeks to maintain rigorous academic programs to produce outstanding educators for Texas and the nation. Admission to College of Education programs is open to all individuals on the basis of academic preparation, ability, and availability of a space in the program selected. When there are more qualified applicants than can be adequately instructed by the available faculty or accommodated in available facilities, the college may control enrollment in specific programs by limiting the admission of new students. Such factors as previous academic work (high school or college transfer credits), entrance examinations, letters of application, letters of reference, and personal interviews may be considered in the admission process.

Admission to the Teacher Certification (Education) Program. Admission to the College of Education does not insure admission to upper-division teacher certification/education programs. To be admitted to teacher certification programs, students must meet the following prerequisites:

(1) A minimum of 60 semester hours with an acceptable scholastic grade-point average. Students seeking elementary school certification (general elementary, bilingual, early childhood, or special education), must have a 2.70 or higher overall GPA. Students seeking other certificates (business education, hearing impairment, secondary, and all-level), must have a 2.50 or higher overall GPA.

Furthermore, students must have a 2.50 GPA for the secondary teaching field(s) or the elementary area of specialization (including the "combination of subjects" and reading) and a 2.50 GPA for the professional education courses. No "D" grades are accepted for the area of specialization, teaching field(s), or professional education courses.

(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 the Texas Academic Skills Program (TASP).

(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.)

Admission to upper division teacher education programs may be subject to additional entrance criteria.

Certification Plan. Any undergraduate student working toward a teacher's certificate should file a certification plan in the College of Education *during the freshman year* or, for transfer students, during the first semester of attendance at Texas Tech. Students in agricultural education or home economics education must consult their department advisor regarding the proper time to file this certification plan. The student's advisors will assist in completing 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 sought, the subject that the student expects to teach, or the level (elementary, secondary, or all-level) at which he or she expects to be certified. 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 must be obtained from the College of Education. Once the form is secured, the student is responsible for consulting with the appropriate advisors to complete the plan.

Admission to Student Teaching. The completion of 6 semester hours in student teaching, all day for ten weeks, is required for certification. Normally a student will take the student teaching course in a single semester during fall or spring of the senior year. Because student teaching requires a major portion of the student's time during the semester, the student should plan to register for student teaching plus the 6 hours of course work which is correlated with student teaching and no other course. The following are prerequisites for 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 secondary schools must have completed at least 60 percent of the semester hours required in each of the teaching fields and 6 semester hours in professional education courses. For those seeking admission to student teaching in the elementary grades, the 90 hours must include (a) 24 of the hours included in the academic specialization area and the combination of subjects taught in the elementary grades, and (b) the completion of 6 semester hours in professional education courses. For those seeking to student teach to fulfill requirements for the early childhood option (Elementary Option IV), all course work except student teaching and 6 hours of professional education should be completed. The

prospective all-level student teacher must have completed 60 percent of the course work in the specialization area plus 6 hours of professional education courses.

(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 apply for fall student teaching, applications must be received between October 15 and December 15 in the year before. To apply for spring student teaching, applications must be received between April 15 and July 15 in the year before. 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 have a grade-point average of 2.50 or higher in professional education courses, in each of the two teaching fields (for secondary teaching), and in the fields of academic specialization (for elementary teaching). Students seeking elementary school or early childhood certification must have a 2.70 or higher overall GPA. Students seeking other certificates (business education, hearing impairment, secondary, and all-level), must have a 2.50 or higher overall GPA.

(4) 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.

(5) The student must attain satisfactory scores on the Texas Academic Skills Program (TASP).

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. Upon completing all requirements, the student is recommended for certification.

While completing the requirements, a student must maintain a 2.50 GPA in the professional development courses and a 2.50 GPA in the teaching field(s) or area of specialization (including reading and the courses commonly taught in the elementary school). Grades of "D" are not acceptable in the professional development courses, in the teaching field(s), or area of specialization (including reading and the courses commonly taught in the elementary school). An acceptable overall GPA is required (2.70 for elementary and early childhood; 2.50 for secondary, all-level, business education, and hearing impairment).

All persons completing teacher training programs who are candidates for initial Texas certification (i.e., those who do not hold a current valid Texas teaching certificate) must pass proficiency tests, Examination for the Certification of Educators in Texas (ExCET), in their fields of certification and endorsement. All candidates for initial teacher certification must pass a professional development test at the appropriate level (elementary, secondary, or all-level); and a content specialization test in each area for which certification is sought. (An "Elementary Comprehensive" test for elementary candidates; teaching field(s) examination(s) such as in biology, mathematics, and English for secondary candidates; and an all-level examination in art, music, or physical education for all-level candidates.)

Contact the College of Education for information about the proficiency tests.

Certificate Programs. Certificate programs have been approved for Texas Tech University at the elementary and secondary levels. In addition, all-level programs have been approved in certain fields (art, music, and physical education) which qualify the individual for certification at both the elementary and secondary levels.

The certificate programs for early childhood, elementary, secondary, vocational, and all-level education have common "General Education" requirements consisting of appropriate courses in the following categories: English (12 hours), Speech (3 hours), U.S. History (6 hours), Political Science (6 hours), Natural Science (8 hours), Mathematics (6 hours at College Algebra level or above), Computing Technology (3 hours), Physical Education (2 hours), Multicultural Foundations (3 hours), Fine Arts (3 hours), and Electives (9 hours from specified areas). A minimum of 60 hours in General Education is required.

Following are descriptions of certificate programs offered at Texas Tech. Appropriate courses must be completed in the suggested categories. Consult an academic advisor for details.

1. *Elementary.*

Elementary Option I is not offered at Texas Tech.

Elementary Option II prepares individuals to teach in grades 1-8. It requires (a) General Education (60 hours of courses noted above); (b) Combination of subjects taught in the elementary school (21 hours including 6 hours of reading); (c) Area of Specialization (18-22 hours of courses from one of the following areas—art, biology, earth science, English, geography, health education, history, mathematics, music, other languages, physical education, reading, or speech communication). Option II graduates are generally not hired to teach an area of specialization but are usually hired to teach in a self-contained classroom—e.g., as a fifth grade teacher; (d) Professional Education (18 hours of educational foundations and methods courses, including 6 hours of student teaching).

Elementary Option III is very similar to Option II, with the exception that areas of specialization are allowed in life science or physical science.

Elementary Option IV certifies individuals to teach in prekindergarten through grade 6, although the emphasis of preparation is on prekindergarten through grade 3. It requires (a) General Education (60 hours of courses noted above); (b) Combination of subjects taught in the elementary school (21 hours); (c) Area of Specialization (24 hours of courses emphasizing early childhood education); (d) Professional Education (18 hours of educational foundations and methods courses, including 6 hours of student teaching).

2. *Secondary.*

Secondary Option I prepares individuals to teach in grades 6-12 with a single teaching field. It requires (a) General Education (60 hours of courses noted above); (b) Teaching Field (36-40 hours in one of the following fields—biology, chemistry, computer information services, earth science, economics, English, geography, government, health education, history, life-earth science, mathematics, other languages, physical science, and physics); (c) Professional Education (18 hours of educational foundations and methods courses, including 6 hours of student teaching).

Secondary Option II prepares individuals to teach in grades 6-12 with two teaching fields. It requires (a) General Education (60 hours of courses noted above); (b) Teaching Fields (24 or more hours in two of the following fields—biology, business administration, business secretarial, chemistry, computer

information services, dance, earth science, economics, English, generic special education, geography, government, health education, history, journalism, mathematics, other languages, physical education, physical science, physics, psychology, reading, sociology, speech communication, and theatre arts); (c) Professional Education (18 hours of educational foundations and methods courses, including 6 hours of student teaching).

Secondary Option III prepares individuals to teach in grades 6-12 with a single broad teaching field. It requires (a) General Education (60 hours of courses noted above); (b) Teaching Field (48-71 hours in one of the following fields—art, business basic, business composite, or music); (c) Professional Education (18 hours of educational foundations and methods courses, including 6 hours of student teaching).

Secondary Option IV prepares individuals to teach in grades 6-12 with a single composite teaching field. It requires (a) General Education (60 hours of courses noted above); (b) Teaching Field (50-64 hours in one of the following fields—English-language arts, science, or social studies); (c) Professional Education (18 hours of educational foundations and methods courses, including 6 hours of student teaching).

3. *Vocational Education.* At Texas Tech, agricultural education and home economics education meet the requirements set forth in the State Plan for Vocational Education. Students wishing 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.* Prepares students to teach grades 1-12 in one of the following fields—art, music, or physical education. It requires (a) General Education (60 hours of courses noted above); (b) Special Field (45-63 hours in one of the following fields—art, music, or physical education); (c) Professional Education (18 hours of educational foundations and methods courses, including 6 hours of student teaching). Consult a physical education advisor about the need of a second teaching field.

5. *Special Education and Bilingual Education.* These programs are available under special circumstances. Consult an advisor to explore program possibilities.

6. *Hearing Impaired.* Students interested in the education of the deaf or hearing impaired should enroll in the College of Education.

7. *Office Systems Technology and Administration.* This program is designed to provide courses at the undergraduate level leading to a Bachelor of Science degree in Office Systems Technology and Administration as well as to prepare graduates for professional secretarial and administrative office careers and for the Certified Professional Secretary (CPS) examination. The academic program can lead to certification in business education.

Uniform Undergraduate Degree Requirements

All bachelors' 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 seven undergraduate 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 Undergradu-

ate 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.

General Education Requirements. General Education requirements are designed to give all students who graduate from the University the opportunity to acquire a general knowledge of areas of study that have traditionally been regarded as basic to a university education. This general knowledge base requires study in the natural sciences, social sciences, humanities, fine arts, and the tools of language and thought. It complies with 1987 Texas legislation requiring each state-supported institution to establish a "core curriculum. . . in the liberal arts, humanities, and sciences, and political, social, and cultural history."

The following requirements must be met by all candidates for a baccalaureate degree at Texas Tech University:

BASIC SKILLS—Communication, Language, and Mathematics

	Semester Credit Hours
Written Communication*	6
Oral Communication	3
Mathematics and Logical Reasoning**	6
Foreign Language (Admission Requirement)***	0
	<hr/> 15

*In addition to the 6 hours of composition and rhetoric, a writing-across-the-curriculum requirement includes 6 hours of writing-intensive courses in the major.

**Courses in logic, computer programming, etc., may be substituted for 3 hours of the requirement.

***Entering students in fall 1991 are expected to have two years of foreign language training. Students who do not meet this requirement will be required to take one year of a foreign language.

SCIENCE AND TECHNOLOGY—Understanding the Natural World and Modern World Technology

	Semester Credit Hours
Natural (Laboratory) Science	8
Technology and Applied Science	3
	<hr/> 11

UNDERSTANDING SOCIETIES AND CULTURES

	Semester Credit Hours
Historical Consciousness (American History)*	6
Political Science (U.S. and Texas)*	6
Individual or Group Behavior	3
	<hr/> 15

*See section below on Required History and Political Science.

HUMANITIES AND FINE ARTS—Appreciation of Humanities and Visual and Performing Arts as Expressions of Human Living

	Semester Credit Hours
Humanities and/or	3
Visual and Performing Arts	3
	<hr/> 6

HEALTH AND PHYSICAL FITNESS

	Semester Credit Hours
Physical Fitness, Marching Band, ROTC, Nutrition	2

GRAND TOTAL

49

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, provided 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.

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 1301, 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 1301, 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 1301, 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, military science, or naval 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 Military Science, the Department of Naval Science, or the Department of Aerospace Studies and the student's academic dean.

3. Any student who has served honorably in the Armed Forces of the United States for a minimum of 90 days may receive credit for 2 semester hours in physical education. Application for this credit must be made in the first semester of attendance at the University.

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 is officially admitted to 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 fall, 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.

Double Major. A student interested in pursuing a double (dual) major should contact his or her academic dean for specific requirements.

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. Remedial courses begin with "0" (MATH 0301, etc.).

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 curriculum sections of this catalog.

ACCT	Accounting	EDSE	Secondary Education
ADV	Advertising	EDSP	Special Education
AECO	Agricultural Economics	E E	Electrical Engineering
AERS	Aerospace Studies	EET	Electrical-Electronics Technology
AGED	Agricultural Education	EFL	English as a Foreign Language
AGEN	Agricultural Engineering	E GR	Engineering Graphics
AGRO	Agronomy	ENGL	English
AGSC	Agricultural Science	ENGR	Engineering
ANM	Anatomy	ENRH	Education, Nutrition and Restaurant-Hotel Management
ANSC	Animal Science	ENTO	Entomology
ANTH	Anthropology	EPSY	Educational Psychology
ARCH	Architecture	ESS	Exercise and Sports Science
ART	Art	E ST	Ethnic Studies
A&SH	Arts and Sciences Honors	F A	Fine Arts
ASTR	Astronomy	FADS	Fashion Design
ATMO	Atmospheric Science	FD T	Food Technology
B A	Business Administration	FFP	Family Financial Planning
BCH	Biochemistry	FIN	Finance
BIOL	Biology	F&N	Food and Nutrition
BLAW	Business Law	FREN	French
BOT	Botany	F S	Family Studies
C E	Civil Engineering	G CH	Geochemistry
CEED	Consumer Economics and Environmental Design	GEOG	Geography
CH E	Chemical Engineering	GEOL	Geology
CHEM	Chemistry	GERM	German
CHIN	Chinese	G PH	Geophysics
CLAS	Classics	GRK	Greek
CLHM	Classical Humanities	G ST	General Studies
C LT	Comparative Literature	GTEC	General Technology
COMS	Communication Studies	HBRW	Hebrew
C S	Computer Science	HCOM	Health Communications
CS&M	Consumer Studies and Management	H D	Human Development
C&T	Clothing and Textiles	HDFS	Human Development and Family Studies
CTEC	Construction Technology	H E	Home Economics
CZEC	Czech	HEED	Home Economics Education
DAN	Dance	HIST	History
ECO	Economics	HLED	Health Education
EDAD	Educational Administration and Supervision	HLTH	Health
EDBE	Business Education	HOM	Health Organization Management
EDBL	Bilingual Education	HORT	Horticulture
EDCI	Educational Curriculum and Instruction	H S	Health Sciences
EDEC	Early Childhood Education	HUM	Humanities
EDEL	Elementary Education	I D	Interior Design
EDHE	Higher Education	I E	Industrial Engineering
EDIT	Educational Instructional Technology	I S	Interdisciplinary Studies
EDRD	Reading Education		

ISQS	Information Systems and Quantitative Sciences	NAVY	Naval Science
ITAL	Italian	OSTA	Office Systems Technology and Administration
JAPN	Japanese	PALA	Park Administration and Landscape Architecture
JOUR	Journalism	PETR	Petroleum Engineering
LAAS	Latin American Area Studies	PF&W	Physical Fitness and Wellness
LAT	Latin	PHIL	Philosophy
LING	Linguistics	PHM	Pharmacology
LPMD	Land-Use Planning, Management, and Design	PHOT	Photography
L S	Library Science	PHY	Physiology
M AP	Applied Music	PHYS	Physics
MATH	Mathematics	POLS	Political Science
MBIO	Microbiology	PORT	Portuguese
MCAG	Mechanized Agriculture	P R	Public Relations
MCEC	Merchandising, Environmental Design, and Consumer Economics	PSY	Psychology
MCOM	Mass Communications	PUAD	Public Administration
M CP	Music Composition	PVM	Preventive Medicine
MD S	Multidisciplinary Studies	RHIM	Restaurant, Hotel, and Institutional Management
M E	Mechanical Engineering	RLS	Recreation and Leisure Services
M ED	Music Education	RUSN	Russian
M EN	Music Ensemble	R&WM	Range and Wildlife Management
MER	Merchandising	SHS	Speech and Hearing Sciences
MFT	Marriage and Family Therapy	SLAV	Slavistics
MGT	Management	SOC	Sociology
MIB	Microbiology	SPAN	Spanish
MILS	Military Science	STAT	Statistics
MKT	Marketing	S W	Social Welfare
M LT	Music Literature	TELE	Telecommunications
MTEC	Mechanical Technology	TH A	Theatre Arts
M TH	Music Theory	W S	Women's Studies
MUS	Music	ZOOL	Zoology
MUSM	Museum Science		



Graduate School

Professor Clyde Hendrick, *Dean*

Graduate study is much more than a continuation of undergraduate work. It is distinguished by the 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 capacity for 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. For study in its degree programs, the Graduate School requires appropriate evidence of an applicant's intellectual ability 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 its 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 Philosophy

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, Textiles, and

Merchandising

Master of Science in Home Economics

Communication Studies

Master of Arts

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

Environmental Design and

Consumer Economics

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

Gerontology

Master of Science

History

Master of Arts

Doctor of Philosophy

Home Economics

Master of Science in Home Economics

Doctor of Philosophy

Home Economics Education

Master of Science in Home Economics

Horticulture

Master of Science

Human Development and Family

Studies

Master of Science in Home Economics

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

Land-Use and Resource

Planning

Master of Science

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

Performance

Master of Music

Petroleum Engineering

*Master of Science in Petroleum
Engineering*

Pharmacology

Master of Science

Doctor of Philosophy

Philosophy

Master of Arts

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

**Restaurant, Hotel, and Institutional
Management**

*Master of Science in Restaurant,
Hotel, and Institutional
Management*

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*

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 W. Frank Newton, *Dean*

Jack F. Maddox Professor of Law Anderson; Robert H. Bean Professor of Law Edgar; George Herman Mahon Professor of Law Quilliam; Professors Baker, Benson, Bubany, Casto, Cummins, Edgar, Eissinger, Krahmer, Kramer, Lee, Phelan, Piatt, Schoen, Skillern, and Weninger; Associate Professors Floyd, Marple, Maxwell, Pawlowic, Viator, and Zanglein; Assistant Professors Rice and Shannon; Lecturers Conboy and Fletcher; Adjunct Professors Hensley and 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.

The Texas Tech University School of Law has earned an excellent reputation in preparing students for the practice of law. Even though the Texas Tech School of Law is the youngest law school in this part of the country, it has always attracted outstanding students. Competing in contests which simulate client counseling, trial of cases, and appeal of cases, these students have won more national championships in the last decade than the students at any other law school in the United States.

The School of Law has a low student-faculty ratio, enabling greater interaction between student and professor. A small student body and faculty diversity are other assets that promote learning.

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 programs for renewable natural resources; 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. Most students interested in scientific aspects of the industry will receive more training in mathematics, computers, and the basic sciences, followed by well-planned courses in agricultural technology. Students interested in natural resource use will receive training in the ecology of conservation of natural resources and the various facets of environmental quality. Food safety and quality are covered in these courses. 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 900-acre farm adjacent to the campus, a 2,300-acre ranch 55 miles south of Lubbock, a livestock arena, a meat laboratory, and a 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. The college's agricultural field laboratories in northeast Lubbock County include the Burnett Center for Beef Cattle Research and Instruction, a 980-acre experimental farm, and facilities for teaching and research in swine, horses, sheep, and feed manufacturing 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 220-acre 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 essential training for graduate students and advanced undergraduates and solutions to problems facing industry. 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 six 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.

General Education Requirements. The University has established general education requirements for all students. These requirements will ensure breadth in each academic program.

Students may consult their academic dean regarding specific general education course requirements; however, these requirements are incorporated in each major or specialization in the college. Students may also find a listing of general education requirements in the *Directory of Classes*.

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 agriculture-undecided but will be assigned to a department and an academic advisor. During the first semester, several introductory courses in agricultural sciences should be selected to assist in determining the preferred area for a major. Students who enter as freshmen should select a major by the end of their fourth semester. Transfer students will be required to make a major selection within two semesters after entering Texas Tech. 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, with certain additions. 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. 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.

3. 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.

4. 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.

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 2305 are required for most majors in the College of Agricultural Sciences. AGSC 1111 should be taken during the freshman year. In addition, most degree programs require each student 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: AGRO 1311, 1321, R&WM 2302

Group 2: ANSC 1301, ENTO 2301, R&WM 2301

Group 3: AGSC 2300, 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.

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, 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 as well as 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. F, S.
- 2300. **Computers in Agriculture (3:2:2).** Use of the microcomputer in agricultural applications. An introduction to BASIC programming language, use of word processing, and electronics spreadsheet software. F, S, SSII.
- 3301. **Agricultural Leadership Principles (3:3:0).** Leadership principles with emphasis on styles of leadership, types of management, group dynamics, managing change, and the adoption process as applied to agriculture and agribusiness.

Department of Agricultural Economics

Professor Kary Mathis, Chairperson.

Professors Ethridge, Graves, and Roy; Associate Professors Elam, Ervin, Freeman, Kennedy, and Owens; Assistant Professors Dodson, Morse, and Segarra; Visiting Associate Professor Condra; Visiting Assistant Professor Snodgrass.

This department supervises the following degree programs: AGRICULTURAL ECONOMICS, *Bachelor of Science*; *Master of Science*; and *Doctor of Philosophy*.

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. Training in agricultural policy, price analysis, agricultural marketing, and farm and ranch appraisal is also provided. The department prepares graduates to manage agribusiness and financial firms, farms, ranches, and related organizations and to direct land and property development and real estate activities.

The department provides undergraduate emphases in agribusiness management, agricultural finance, farm management, ranch management, general agricultural economics, and real estate. Programs are available for advanced study in agricultural economics, law, economics, or related areas and for teacher certification. Students interested in teaching vocational agriculture should meet with their departmental advisors and with an advisor from the Department of Agricultural Education and Mechanization early in their programs. The Department of Agricultural Economics requires a C or higher in all departmental courses for students majoring in Agricultural Economics.

A prestigious honors program, which includes a select set of analytical courses — AEEO 4300, 4301, 4302, 4312, and 4314 — is available for students who demonstrate high academic achievement. The honors program may be elected with any emphasis and, upon successful completion, will be designated on the student's academic transcript. A 3.00 overall GPA and 3.25 in agricultural economics courses at the end of the junior year (96 hours) is required for eligibility. Prerequisite courses are ECO 3311 and ENGL 3365. Students electing the honors program in agricultural economics may also participate in Honors Studies offered by the College of Arts and Sciences.

Courses in Agricultural Economics. (AEEO)

- 2305. Fundamentals of Agricultural Economics (3:3:0).** Basic training in fundamental economic principles and their application to agricultural problems. F, S, SS.
- 2306. Principles of Marketing Agricultural Products (3:2:3).** Prerequisite: AEEO 2305 or equivalent. Introduction to the marketing of agricultural products emphasizing marketing costs, margins, and functions and showing applications of economic principles to marketing problems. F, S, SS.

- 3302. Agricultural Finance (3:3:0).** Prerequisite: AECO 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. F, S, SS.
- 3303. Cooperatives in Agriculture (3:3:0).** Prerequisite: AECO 2306. Organization and operation of agricultural cooperatives. S.
- 3304. Farm and Ranch Management (3:2:3).** Prerequisite: AECO 2305 or equivalent. Organization and management of the individual farm or ranch business. F, S.
- 3305. Farm and Ranch Estate Planning (3:3:0).** Prerequisite: Junior standing or approval. Farm and ranch management alternatives in estate planning. Emphasis on understanding agricultural taxation problems and nontax aspects of estate planning. S.
- 3314. Agricultural Law (3:3:0).** Examines the legal system, contracts, torts, property law, federal regulatory programs, market orders, Packers and Stockyards Act, bankruptcy law, and Uniform Commercial Code in an agricultural context. F, SS.
- 3315. Agricultural Price Theory (3:3:0).** Prerequisite: AECO 2305, MATH 1331, and junior standing. Basic economic principles with applications to agricultural pricing problems and resource allocations. F, S, SS.
- 3316. Production Economics (3:3:0).** Prerequisite: AECO 2305, MATH 1331, and junior standing. Economic tools for analyzing problems facing the firm. Decision-making processes using production functions, costs, resource demand, market prices, linear programming, and time considerations. F, S, SS.

Agricultural Economics Curriculum.

Agribusiness Management		Ranch Management	
Fall	Spring	Fall	Spring
FIRST YEAR			
AGSC 1111 Lab. Sci. (4 hrs.) ENGL 1301 MATH 1330 POLS 1301 Basic agriculture (3 hrs.) P.E., Band, ROTC, or Nutr. (1 hr.) 18 hrs.	Lab. Sci. (4 hrs.) MATH 1331 AECO 2305 ENGL 1302 AGSC 2300 P.E., Band, ROTC, or Nutr. (1 hr.) 17 hrs.	AGSC 1111 CHEM 1101 CHEM 1305 ENGL 1301 MATH 1330 ANSC 1301 AGSC 2300 P.E., Band, ROTC, or Nutr. (1 hr.) 18 hrs.	AECO 2305 CHEM 1102 CHEM 1306 ENGL 1302 HIST 2300 MATH 1331 P.E., Band, ROTC, or Nutr. (1 hr.) 17 hrs.
SECOND YEAR			
ECO 2302 ENGL 2309 HIST 2300 Humanities (3 hrs.) POLS 2302 Elective (3 hrs.) 18 hrs.	AECO 2306 Humanities (3 hrs.) AECO 3302 HIST 2301 COMS 2300 or 3308 Elective (3 hrs.) 18 hrs.	AECO 3302 POLS 1301 ECO 2302 HIST 2301 Humanities (3 hrs.) 15 hrs.	AECO 2306 AECO 3304 ANSC 3302 ENGL 2309 R&WM 3303 Humanities (3 hrs.) 18 hrs.
THIRD YEAR			
AECO 3304 AECO 3314 AECO 3315 ACCT 2300 ECO 3311 Elective (3 hrs.) 18 hrs.	AECO 3316 AECO 3401 AECO 4317 ACCT 2301 Elective (3 hrs.) 16 hrs.	AECO 3315 AECO 3401 ACCT 2300 POLS 2302 ANSC 3305 16 hrs.	AECO 3316 COMS 2300 or 3308 ACCT 2301 R&WM 4302 ECO 3311 15 hrs.
FOURTH YEAR			
AECO 4300 AECO 4305 AECO 4312 AECO 4315 Elective (3 hrs.) 15 hrs.	AECO 4101 AECO 4301 AECO 4302 AECO 4306 Elective (4 hrs.) 14 hrs.	AECO 4300 AECO 4303 AECO 4312 AECO 4317 Elective (5 hrs.) 17 hrs.	AECO 4101 AECO 4301 AECO 4314 Elective (11 hrs.) 18 hrs.

Elective hours—16

Laboratory Science—8 hours must be from ATMO, BIOL, CHEM, or PHYS. Basic agriculture electives must be selected from HORT 1311, AGRO 1321, R&WM 2301, 2302, or ANSC 1301.

Agribusiness Management—9 hours of the 19 hours of electives must be selected from junior or senior level courses in business administration or economics.

Ranch Management—The 16 hours of electives must include 3 hours from ANSC 4305, 4306, 4308, or 4401, and 6 hours of junior or senior level courses in the College of Agricultural Sciences.

- 3401. Agricultural Statistics (4:3:3).** Prerequisite: MATH 1331 and junior standing. 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. F, S, SS.
- 4000. Internship in Agricultural Economics (V1-12).** Prerequisite: Junior standing and approval. Supervised study providing in-service training and practice in agricultural business and organizations. F, S, SS.
- 4101. Current Problems in Agricultural Economics (1).** Topics may vary. May be repeated twice for credit. F, S, SS.
- 4300. Agricultural Economics Methodology for Research and Management (3:3:0).** Prerequisite: AECO 3315, 3316, 3401, ENGL 2309, and junior standing. 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. F.
- 4301. Special Problems in Agricultural Economics (3).** Prerequisite: AECO 4300 or approval. Individual instruction and assigned research on a problem of interest to the students. May be repeated with approval of department chairperson. S.
- 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. S.

Agricultural Economics Curriculum.

Agricultural Finance		Farm Management	
Fall	Spring	Fall	Spring
FIRST YEAR			
AGSC 1111 Lab. Sci. (4 hrs.) ENGL 1301 MATH 1330 AGSC 2300 Basic agriculture (3 hrs.) 17 hrs.	AECO 2305 Lab. Sci. (4 hrs.) ENGL 1302 POLS 1301 MATH 1331 P.E., Band, ROTC, or Nutr. (1 hr.) 17 hrs.	AGSC 1111 CHEM 1101 CHEM 1305 ENGL 1301 MATH 1330 AGSC 2300 AGRO 1321 P.E., Band, ROTC, or Nutr. (1 hr.) 18 hrs.	AECO 2305 CHEM 1102 CHEM 1306 ENGL 1302 HIST 2300 MATH 1331 P.E., Band, ROTC, or Nutr. (1 hr.) 17 hrs.
SECOND YEAR			
ACCT 2300 AECO 2306 ENGL 2309 ECO 2302 HIST 2300 P.E., Band, ROTC, or Nutr. (1 hr.) 16 hrs.	AECO 3302 ACCT 2301 Humanities (3 hrs.) HIST 2301 POLS 2302 COMS 2300 or 3308 18 hrs.	AECO 3302 AECO 3304 ECO 2302 HIST 2301 Humanities (3 hrs.) 15 hrs.	AECO 2306 ENGL 2309 POLS 1301 AGRO 2432 Humanities (3 hrs.) 16 hrs.
THIRD YEAR			
AECO 3304 AECO 3314 AECO 3315 ACCT (3 hrs.) ECO 3323 Humanities (3 hrs.) 18 hrs.	ACCT (3 hrs.) AECO 3316 AECO 3401 ECO 3311 Elective (3 hrs.) 16 hrs.	ACCT 2300 AECO 3315 AECO 3401 POLS 2302 Elective (3 hrs.) 16 hrs.	ACCT 2301 AECO 3316 COMS 2300 or 3308 ECO 3311 Elective (6 hrs.) 18 hrs.
FOURTH YEAR			
AECO 4300 AECO 4312 AECO 4315 FIN 3320 Elective (4 hrs.) 16 hrs.	AECO 4101 AECO 4301 AECO 4303 AECO 4316 FIN 4323 Elective (3 hrs.) 16 hrs.	AECO 4300 AECO 4305 AECO 4312 AECO 4317 Elective (6 hrs.) 18 hrs.	AECO 4101 AECO 4301 AECO 4303 AECO 4314 Elective (6 hrs.) 16 hrs.

Lab. Sci.—8 hours must be from ATMO, BIOL, CHEM, or PHYS.

Basic agriculture electives must be selected from HORT 1311, AGRO 1321, R&WM 2301, 2302, or ANSC 1301.

Agricultural Finance—Courses recommended for the 10 hours of electives may be from AECO 4317, ECO 4323, 4332, FIN 4324, 4325, and 4330. The 6 hours of upper-level accounting courses must be from ACCT 3301, 3304, 3305, 3307, 3315, and 4302.

Farm Management—The 21 hours of electives must include 9 hours from MCAG 3301, 3302, or 3303; AGRO 3323, 3421, 4131, 4335; ENTO 2301, 3305, or 4301; and 6 hours of junior or senior level courses in the College of Agricultural Sciences.

- 4303. Farm and Ranch Appraisal (3:3:0).** 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. F, S, SS.
- 4305. Agricultural Policies and Organizations (3:3:0).** Prerequisite: AECO 3315 or equivalent. 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. F, SS.
- 4306. Trade in Agricultural Products (3:3:0).** Prerequisite: Junior standing and AECO 3315 or equivalent. Economic principles of interregional and international trade, location, and inter-area competition in agricultural products. S.
- 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. F.
- 4313. Agricultural Resource Economics (3:3:0).** Prerequisite: AECO 3316 and junior standing. Economics of agricultural resource allocation including land economics and economics of water development, allocation, and conservation. F.
- 4314. Advanced Production Management (3:2:3).** Prerequisite: AECO 3304, 3315, 3316, 3401 or equivalents. Advanced principles and practices emphasizing methods and techniques for analyzing agricultural production firm organization prob-

Agricultural Economics Curriculum.

Real Estate		General Agricultural Economics	
Fall	Spring	Fall	Spring
FIRST YEAR			
AGSC 1111 CHEM 1101 CHEM 1305 ENGL 1301 MATH 1330 AGSC 2300 Basic agriculture (3 hrs.) P.E., Band, ROTC, or Nutr. (1 hr.) 18 hrs.	AECO 2305 Lab. Sci. (4 hrs.) ENGL 1302 HIST 2300 MATH 1331 P.E., Band, ROTC, or Nutr. (1 hr.) 17 hrs.	AGSC 1111 Lab. Sci. (4 hrs.) ENGL 1301 MATH 1330 POLS 1301 Basic agriculture (3 hrs.) P.E., Band, ROTC, or Nutr. (1 hr.) 18 hrs.	Lab. Sci. (4 hrs.) MATH 1331 AECO 2305 ENGL 1302 AGSC 2300 P.E., Band, ROTC, or Nutr. (1 hr.) 17 hrs.
SECOND YEAR			
AECO 3304 HIST 2301 AGRO 2432 ENGL 2309 Humanities (3 hrs.) 16 hrs.	AECO 2306 COMS 2300 or 3308 POLS 1301 ACCT 2300 ECO 2302 15 hrs.	ECO 2302 ENGL 2309 HIST 2300 POLS 2302 Humanities (3 hrs.) Elective (3 hrs.) 18 hrs.	AECO 2306 AECO 3302 HIST 2301 COMS 2300 OR 3308 Humanities (3 hrs.) Elective (3 hrs.) 18 hrs.
THIRD YEAR			
AECO 3315 AECO 3401 POLS 2302 ACCT 2301 BLAW 3393 16 hrs.	ECO 3311 FIN 3320 AECO 3316 Humanities (3 hrs.) Elective (6 hrs.) 18 hrs.	AECO 3304 AECO 3315 ACCT 2300 ECO 3311 Elective (6 hrs.) 18 hrs.	AECO 3316 AECO 3401 ACCT 2301 Elective (6 hrs.) 16 hrs.
FOURTH YEAR			
AECO 4300 AECO 4303 AECO 4312 AECO 4313 FIN 3332 Elective (3 hrs.) 18 hrs.	AECO 4101 AECO 4301 FIN 3334 Elective (9 hrs.) 16 hrs.	AECO 4300 AECO 4305 AECO 4312 AECO 4314 or 4315 Elective (3 hrs.) 15 hrs.	AECO 4101 AECO 4301 AECO 4302 Elective (7 hrs.) 14 hrs.

Lab. Sci.—8 hours must be from ATMO, BIOL, CHEM, or PHYS.

Basic Agriculture electives must be from HORT 1311, AGRO 1321, R&WM 2301, 2302, or ANSC 1301.

Real Estate—At least 12 of the 18 elective hours must be from BLAW 3391, 3392, 3395, FIN 4324, 4326, 4333, SOC 3361, 3323, ECO 3302, 4334, PALA 2401, 4303, R&WM 3101, 3301, 3304, 4302, MCAG 2302, ANSC 3302, 3305, AECO 3305, 3314, 4302, or 4317.

General Agricultural Economics—12 hours of the 28 hours of electives must be from the following courses: AECO 3314, 4306, 4313, 4317, ECO 3323, 3330, 4323; and junior or senior level courses in Business Administration.

lems; enterprise budgeting, case studies, computer simulation, linear programming. S.

4315. Agricultural Business Management (3:2:3). Prerequisite: AECO 3315, 3316, 3401 or equivalents. Managerial techniques applied to decision-making problems of agricultural business firms in the procurement, handling, storage, processing and distribution of agricultural inputs and products. F.

4316. Agricultural Financial Analysis (3:3:0). Prerequisite: AECO 3302, 3315 or equivalents. 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. S.

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. F, S, SS.

Department of Agricultural Education and Mechanization

Professor Paul Vaughn, Chairperson.

Professor Cepica and Eggenberger; Assistant Professor Doerfert; Visiting Assistant Professors Frazee and Lawver.

This department supervises the following degree programs: AGRICULTURAL EDUCATION, *Bachelor of Science*, *Master of Science*, and *Master of Education*; MECHANIZED AGRICULTURE, *Bachelor of Science*; and TEXTILE TECHNOLOGY AND MANAGEMENT, *Bachelor of Science*.

The department administers the agricultural education certification program and the teacher certification for Ornamental Horticulture Specialization, the general agricultural education and agricultural communications specialization areas; and the production and agricultural business management specialization areas in mechanized agriculture and the textile technology and management program.

The teacher certification program involves courses from each department in the College of Agricultural Sciences. Elective courses can be selected in areas of special interest. Job placement in high schools and junior colleges offers a life-long career for many and alternative employment opportunities for others. Students seeking teacher certification may also receive a degree in another agricultural area and, with proper planning, receive certification in agricultural education. Students seeking teacher certification should also refer to the section entitled "Teacher Education."

General Agriculture involves completion of a variety of agriculture and general courses similar to certification with the exception that students will choose electives outside the education component. The elective courses allow students to reinforce their areas of interest to meet requirements for various occupations.

Agricultural Communications allows students to specialize in both mass communications and agriculture. The communication component consists of prescribed courses in journalism, speech, telecommunications, photography, and advertising. Selection of technical agriculture courses allows students to specialize in areas of interest and to reinforce their general knowledge in agriculture.

Mechanized Agriculture (Agribusiness) involves a detailed study in agricultural economics and mechanized agriculture. Students obtain expertise in business management techniques coupled with the mechanized agriculture component to prepare them for employment in agribusiness. Mechanized Agriculture (Production) involves a cross-sectional study of agricultural production techniques with supporting courses in mechanized agriculture for students who desire to enter agricultural management or processing of commodities.

Agricultural Education Curriculum—Teacher Certification.

FIRST YEAR			
<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AGRO 1321, Agronomic Plant Sc.	3
BIOL 1401 or 1402	4	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	HIST 2300, Hist. of U.S. to 1877	3
MATH 1320, Coll. Algebra	3	CHEM 1305, Ess. Chem. I	3
ANSC 1301, Gen. Animal Sci.	3	CHEM 1101, Exp. Gen. Chem. I	1
P.E., Band, ROTC, or Nutr.	1	MATH 1321, Trigonometry	3
	<u>15</u>	P.E., Band, ROTC, or Nutr.	<u>1</u>
			17

SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
CHEM 1306, Ess. Chem. II	3	AGED 2300, Intro. to Ag. Ed.	3
CHEM 1102, Exp. Gen. Chem. II	1	COMS 2300, Public Speaking	3
ENGL 2309, Tech. Writing	3	AECO 2305, Fund. Ag. Eco.	3
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
HIST 2301, Hist. of U.S. since 1877	3	†Ag. Elective	3
HORT 1311, Prin. of Horticulture	3	*Humanities & Fine Arts	<u>3</u>
MCAG 2201, Welding & Metalwork	2		18
	<u>18</u>		

THIRD YEAR			
<i>Fall</i>		<i>Spring</i>	
MCAG 2301, Ag. Elec.	3	AECO 3304, Farm & Ranch Mgt.	3
AGRO 2432, Prin. & Pract. Soils	4	MCAG 3303, Small Gas Eng.	3
ANSC 3305, Appl. Anim. Nutr.	3	ANSC 3302, Livestock Prod.	3
ENGL 2301 or 2307	3	AGRO 3421, Fund. Prin. of Gen.	4
†Ag. elective	3	Elective	4
	<u>16</u>		<u>17</u>

FOURTH YEAR			
<i>Fall</i>		<i>Spring</i>	
EDSE 3300, Fund. Sec. Educ.	3	AGED 3331, Prin. of Ag. Leadership	3
AGSC 2300, Comp. in Ag.		AGED 4304, High School Meth.	3
or AGED 3302	3	AGED 4306, Student Tchg.	6
AGED 3330, Inter. Ag. Agency	3	EDSE 3321, Curr. Dev. Sec. Educ.	<u>3</u>
MCAG 4302, Ag. Bldg.	3		15
EPSY 3330, Ed. Psych.	3		
†Ag. elective (3000 or 4000 level)	3		
	<u>18</u>		

*To be selected from Category D of the General Education Requirements.

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

†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: At least 3 hrs. of advanced agricultural credit.

Preemployment Laboratory in General Agricultural Mechanics: MCAG 3301, 3302.

Preemployment Laboratory in Meats: ANSC 2301, 3101, 3201.

General Agricultural Education Specialization.

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

Substitute	AGRO 4421	for AGED 4306
	AGED 4000 (3)	for EDSE 3321
	AGED 4000 (2)	for AGED 4306
	AGED 4302	for AGED 4304
	6 hrs. electives	for EPSY 3330
		EDSE 3300

COMS 2300 or 3308 can be taken for Gen. Ag. specialization.

Graduates of this specialization can enter occupations requiring a degree in agriculture.

Agricultural Education Curriculum — Teacher Certification, Ornamental Horticulture Specialization.

Natural Science Courses: 12 hours

BIOL 1401 or 1402	Biology of Plants or Biology of Animals
CHEM 1305, 1306	Essentials of Chemistry I, II
CHEM 1101, 1102	Experimental General Chemistry I, II (Laboratory)

General Courses: 36 hours

MATH 1320	College Algebra
MATH 1321	Trigonometry
HIST 2300, 2301	American History
POLS 1301, 2302	American Government
ENGL 1301, 1302	College Rhetoric
ENGL 2309	Technical Writing
ENGL 2301	Masterpieces of Literature
or 2307	or Introduction to Fiction
COMS 2300	Public Speaking

Humanities and Fine Arts Courses: 3 hours

(To be selected from Category D of General Education Requirements)

Education Courses: 18 hours

EPSY 3330	Educational Psychology
EDSE 3300	Fundamentals of Secondary Education
EDSE 3321	Curriculum Development in Secondary Education
AGED 4304	Methods of Teaching Vocational Agriculture
AGED 4306 (6 hrs.)	Student Teaching

Agricultural Sciences and Botany Courses: 57-58 hours

AECO 2305	Agricultural Economics
AGED 2300	Introduction to Agricultural Education
AGED 3330	Interrelationships of Agricultural Agency
	Information Systems
AGRO 1321	Agronomic Plant Science
AGRO 2432	Principles and Practices in Soils
AGRO 3421	Fundamental Principles of Genetics
AGSC 1111	Agricultural Industry
AGSC 2300	Computers in Agriculture
AGSC 3301	Agricultural Leadership Principles
ENTO 2301	Introductory Entomology
BOT 3302	Plant Pathology
BOT 3304	Taxonomy of the Flowering Plant
BOT 3401	Plant Physiology
or AGRO 4324	or Agricultural Plant Physiology

18 hours from the following courses:

HORT 1311	Principles of Horticulture
HORT 2312	Propagation Methods

HORT 2313	Herbaceous Plant Materials
HORT 2314	Woody Plants
HORT 3312	Principles of Floriculture
HORT 3314	Nursery Materials Usage for the Home
HORT 3316	Garden Center and Nursery Management
HORT 3317	Interior Plants
HORT 4313	Arboriculture

3 hours from the following courses:

AGRO 4335	Soil Fertility Management
HORT 2311	Vegetable Crops
HORT 3311	Tree Fruit Culture

2 hours of P.E., Band, ROTC, or Nutrition

3-4 hours of electives

Agricultural Communications Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	ANSC 1301, Gen. Animal Science	3
BIOL 1401 or 1402	4	ENGL 1302, Adv. College Rhetoric	3
ENGL 1301, Ess. College Rhetoric	3	HIST 2300, Hist. of U.S. to 1877	3
MATH 1320, College Algebra	3	CHEM 1305, Ess. Chem. I	3
AGED 2301, Intro. Ag. Ed. & Info. Sys.	3	CHEM 1101, Exp. Gen. Chem. I	1
P.E., Band, ROTC, or Nutr.	1	MATH 1321, Trigonometry	3
	<u>15</u>	P.E., Band, ROTC, or Nutr.	<u>1</u>
			17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
MCOM 1300, Intro. to Mass Comm.	3	AGRO 1321, Agronomic Plant Science	3
AECO 2305, Fund. Ag. Economics	3	HIST 2301, Hist. of U.S. Since 1877	3
POLS 1301, Amer. Govt., Org.	3	AGED 3302, Ag. Data Base Networks	3
ENGL 2309, Patterns of Repts.	3	ENTO 2301, Intro. Entomology	3
Basic Science Elective	4	PHOT 2301, Basic Photography	3
	<u>16</u>	*Humanities and Fine Arts	<u>3</u>
			18

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
JOUR 3310, News Writing	3	JOUR 3312, Reporting	3
COMS 3308, Business & Prof. Speech	3	HORT 1311, Prins. of Horticulture	3
ADV 3310, Prins. of Advertising	3	POLS 2302, Am. Public Pol.	3
R&WM 2301, Introductory Wildlife	3	TELE 3310, Intro. to Telecomm.	3
Advanced Ag. Elective	3	AGED 3200, Writing for Agriculture	2
*Humanities and Fine Arts	3	Advanced Ag. Elective	<u>3</u>
	<u>18</u>		17

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
JOUR 4380, Editing	3	AGED 4100, Seminar in Ag. Comm.	1
AGSC 2300, Computers in Ag.	3	Communications Elective	3
R&WM 2302, Ecol. & Conservation	3	Advanced Ag. Electives	6
Advanced Ag. Elective	3	Electives	<u>5</u>
Communications Elective	3		15
AGED 4302, Transfer of Ag. Tech.	<u>3</u>		
	18		

* To be selected from Category D of General Education Requirements.
Broadcast emphasis requires completion of JOUR 3314 and TELE 3350.

Textile Technology and Management

Textile Technology and Management provides an excellent interdisciplinary education in the various phases of producing, processing, marketing, and converting textile fibers into yarns and then into woven and knitted fabric. Courses in textiles, business, marketing, merchandising, production, and processing, together with a general education program, prepare students for responsible positions in the textile industry and business. For more information on this program, contact the department chairperson or the dean's office.

Courses in Agricultural Education. (AGED)

- 2300. Introduction to Agricultural Sciences Development (3:3:0).** Prerequisite: Sophomore standing or departmental approval. History and principles of vocational education, community assessment of agricultural programs planning, and development of agricultural youth organization.
- 2301. Introduction to Agricultural Education and Information Systems (3:3:0).** An overview of information systems and media associated with the agricultural industry. F.
- 3200. Writing for Agriculture (2:1:2).** Prerequisite: JOUR 3310. Students integrate various skills, including writing, editing, and layout, in producing agriculture publications. Emphasis on computer software applications in agricultural publishing. S.
- 3302. Agricultural Data Base Networks, Information Systems, and Populace (3:3:0).** Computer hardware and software used in agricultural data base networks, and the interface with the agricultural populace. F, S, SS.
- 3303. Communicating Agriculture to the Public (3:2:2).** Principles and procedures in communicating agricultural news and information to general and specialized audiences through presentations and various media. S.
- 3330. Interrelationships of Agricultural Agency Information Systems (3:2:2).** Prerequisite: Sophomore standing or departmental approval. Utilization of agricultural service systems to disseminate information to traditional and nontraditional agricultural clientele. Emphasis on USDA organizations.
- 3331. Principles of Agricultural Leadership (3:3:0).** Application of leadership principles with emphasis on interpersonal and personal skills, dynamics of organizational structure, and institutional and agency leadership. For student teaching only.
- 4000. Internship (V1-12).**
- 4100. Seminar in Agricultural Communications (1:1:0).** Prerequisite: Senior standing or departmental approval. Overview and analysis of the history, development, issues, and trends of traditional agricultural and related information outlets. May be repeated once for credit. S.
- 4301. Agricultural Education Problems (3).** Prerequisite: Senior standing and approval of department chairperson. Individual investigation. May be repeated for credit. F, S, SS.
- 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. F.
- 4304. Methods of Teaching Vocational Agriculture in the High School (3:2:3).** F, S.
- 4306. Student Teaching (3).** Prerequisite: Senior standing in agricultural education.

Mechanized Agriculture Curriculum, Production Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AECO 3302 or 3304	3
AGRO 1321, Ag. Plant Science	3	CHEM 1305, Ess. of Chem. I	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1101, Exp. Gen. Chem. I (Lab.)	1
MATH 1320, Coll. Algebra	3	ENGL 1302, Adv. Coll. Rhetoric	3
MCAG 1301, Prin. of Ag. Mech.	3	MATH 1321, Trigonometry	3
AECO 2305, Fund. Ag. Eco	3	AGSC 2300, Com. in Ag.	
P.E., Band, ROTC, or Nutr.	1	or AGED 3302	3
	17	P.E., Band, ROTC, or Nutr.	1
			17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 1306, Ess. of Chem. II	3	MCAG 2302, Ag. Surveying	3
CHEM 1102, Exp. Gen. Chem. II (Lab.)	1	POLS 1301, 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, Ag. Elec.	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1	†PHYS 1307, Gen. Phys.	3
MCAG 2201, Welding & Metalwork	2	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
COMS 3308, Bus. & Prof. Speech	3		16
ENGL 2301 or 2307	3		
	19		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ENGL 2309	3	ENTO 3305 or 3306	3
ENTO 2401, Intro. Ento.	4	FD T 2301 or 2300	3
*POLS 2302, Amer. Pub. Pol.	3	AGRO 2432, Prin. & Pract. Soils	4
MCAG 3301, Ag. Prod. Mach.	3	MCAG 3303, Small Gas. Eng.	3
MCAG 3302, Irrig. Prin. & Pract.	3	**Emphasis	3
**Emphasis	3		16
	19		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 3302, Lvstk. Prod.	3	AGSC 3301, Ag. Leadership Prin.	3
PALA 4304, Watershed Mgt.	3	AGED 4302, Transfer of Ag. Tech.	3
MCAG 4302, Ag. Bldgs. & Envir. Cont.	3	General elective	4
**Emphasis	3	**Emphasis	5
††Humanities & Fine Arts	3		15
	15		

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutrition—132.

All electives must have faculty approval.

*See catalog for other history and political science courses satisfying graduation requirements.

†Geology or biology (4 hrs.) may be substituted.

†† To be selected from Category D of Gen. Ed. Requirements

**At least one additional 3 hr. course in plant science; animal science; and range management; and 6 hrs. in agricultural economics or business administration.

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. F, S.

2201. Welding and Metalwork (2:1:3). Metal fabrication and repair using hand tools, power tools, and welding equipment.

Mechanized Agriculture Curriculum, Agricultural Business Management Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
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 1330, Intro. Math Analysis	3	*HIST 2300, Hist. of U.S. to 1877	3
MCAG 1301, Prin. Ag. Mech.	3	MATH 1331, Intro. Math Analysis	3
AGRO 1321, Ag. Plant Science	3	MCAG 2201, Welding & Metalwork	2
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	18		19

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
AECO 2306, Prin. Mkt. Ag. Prod.	3	MCAG 2302, Ag. Surveying	3
ACCT 2300, Elem. Acct. I	3	AECO 4305, Ag. Policies	3
MCAG 2301, Ag. Elec.	3	ENGL 2309	3
AGRO 2432, Prin. & Pract. Soils	4	*POLS 1301, Amer. Govt., Org.	3
*HIST 2301, Hist. of U.S. since 1877	3	AGSC 2300, Comp. in Ag.	
	16	or AGED 3302	3
		ENGL 2301 or 2307	3
			18

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
AECO 3302, Ag. Finance	3	AECO 3316 or ECO 3320	3
AECO 3315 or ECO 3312	3	MCAG 3303, Small Gas Engines	3
ANSC 3302, Livestock Prod.	3	MCAG 3301, Ag. Prod. Mach.	3
MCAG 3302, Irrig. Prin. & Pract.	3	COMS 3308, Bus. & Prof. Speech	3
*POLS 2302, Amer. Pub. Pol.	3	Elective (Adv. agriculture)	3
	15		15

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
AECO 4317, Commodity Futures	3	AGED 4302, Transfer of Ag. Tech	3
AECO 4315, Ag. Bus. Mgt.	3	AECO 3401 or ISQS 2445	4
BLAW 3391, Business Law I	3	AECO 4316, Ag. Financial Anal.	3
MCAG 4302, Ag. Buildings	3	AGSC 3301, Ag. Leadership Prin.	3
Elective (general)	3	Elective (general)	2
**Humanities and Fine Arts	3		15
	18		

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutrition—132.

*See catalog for other history and political science courses satisfying graduation requirements.

**To be selected from Category D of Gen. Ed. Requirements

- 2301. Agricultural 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. F, S.
- 2302. Agricultural Surveying and Land Conservation (3:2:3).** Basics of traversing, computation of curves, land areas, construction layout and staking, and establishment of grades and elevations for landscape architecture and agricultural purposes. Includes uses and care of equipment, application of stadia measurement and the rudiments of land measurement systems.
- 3301. Agricultural Production Machinery (3:3:0).** The development, classification, operation, adjustment, maintenance, and repair of agricultural production machines. Includes tillage, planting, cultivating, and harvesting machinery. F, S.

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. F.
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. F, S.
4000. **Internship (V1-12).**
4100. **Mechanized Agriculture Seminar (1:1:0).** Prerequisite: Senior standing or consent of instructor. Includes lectures, oral and written reports, assigned readings, and required field trips related to agricultural mechanization.
4301. **Agricultural Mechanization Problems (3).** Prerequisite: Consent of instructor. Individual study of an advanced phase of agricultural mechanization. Research report required. F, S, SS.
4302. **Agricultural Buildings and Environmental Control (3:2:3).** Determining agricultural building requirements, materials, design, and construction. Includes construction, tools and equipment, framing, environmental control, and necessary utilities. F, S.
4304. **Agricultural Equipment Hydraulic Systems (3:2:3).** Prerequisite: MCAG 3301. Design theory of operation and maintenance of agricultural equipment hydraulic systems. Includes troubleshooting and solutions to functional system problems.

Department of Agronomy, Horticulture, and Entomology

Professor George Tereshkovich, Acting Chairperson.

Horn Professor Dregne; Rockwell Professor Taylor; Thornton Professor Matches; Professors B. Allen, Bennett, and Krieg; Associate Professors Hopper, Morgan, Nguyen, Phillips, Thorvilson, and Zartman; Assistant Professors R. Allen, Peffley, and Sites; Instructor McKenney; Adjunct Professors Abernathy, Archer, Brigham, Burke, Gannaway, Hatfield, Hayes, Lipe, J. Mahon, McMicheal, Onken, Quisenberry, Rosenow, Rummel, J. Supak, Wanjura, and Wendt; Adjunct Associate Professor Morrison; Adjunct Assistant Professors Bender, Hickey, Keeling, Lascano, Leser, Mollhagen, Trolinder, and Upchurch; Research Scientist and Lecturer Chandler.

The department supervises the following degree programs: *Bachelor of Science* in AGRONOMY, HORTICULTURE, and ENTOMOLOGY; *Master of Science* in CROP SCIENCE, ENTOMOLOGY, HORTICULTURE, and SOIL SCIENCE; *Doctor of Philosophy* in AGRICULTURE with an option in Agronomy. Hours required for graduation are 132 plus 2 hours minimum of physical education, band, ROTC, or nutrition.

As practiced today, students in the departmental areas of applied biology (Agronomy, Horticulture, and Entomology) investigate the basic biological, physical, and social sciences, and more importantly, bring such knowledge to focus on problems in pest control and plant development through genetics, plant growth through management, and plant material use for food, fiber, or the aesthetic good of humankind.

Agronomy includes the study of soil, plant genetics, breeding, biotechnology, molecular biology, physiology, biochemistry, weed and pest control, and crop management as applied to the efficient and economical production of field crops. Students study how to use and manage soils, which includes the

Agronomy, Science Emphasis.

FIRST YEAR			
<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. College Rhetoric	3	ENGL 1302, Adv. College Rhetoric	3
AGRO 1321, Agr. Plant Sci.	3	AGSC 2300, Comp. in Ag.	3
BIOL 1401, Biol. of Plants	4	MATH 1331, Intro. Math. Anal.	3
MATH 1330, Intro. Math. Anal.	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1307, Prin. of Chem. I	3	CHEM 1104, Prin. of Chem. II (Lab.)	1
CHEM 1103, Prin. of Chem. I (Lab.)	1	Elective	4
	<u>17</u>		<u>17</u>
SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
CHEM 3305, Organic Chem. I	3	CHEM 3306, Organic Chem. II	3
CHEM 3105, Organic Chem. Lab.	1	CHEM 3106, Organic Chem. Lab.	1
HIST 2300, U.S. to 1877	3	HIST 2301, U.S. since 1877	3
ENGL 2309, Rpts. & Corresp., or ENGL 3365, Prof. Rpt. Writ.	3	ENTO 2401, Intro. Ento.	4
AECO 2305, Fund. Ag. Eco. or ECO 2301, Prin. of Econ.	3	Group B course	3
AGRO 2432, Prin. & Prac. Soils	4	Elective	3
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>18</u>		<u>18</u>
THIRD YEAR			
<i>Fall</i>		<i>Spring</i>	
AECO 3401, Ag. Stats	4	BOT 3401, Plant Phys.	4
POLS 1301, Am. Gov. Org.	3	POLS 2302, Am. Pub. Pol.	3
HORT 4315, Ag. Biotech.	3	ENTO 4301, Ag. Compounds	3
MBIO 3400, Microbiology	4	Group A course	3
Elective	2	Group B course	3
	<u>16</u>		<u>16</u>
FOURTH YEAR			
<i>Fall</i>		<i>Spring</i>	
Humanities or Fine Arts	3	AGRO 4100, Seminar	1
BOT 3302, Plant Path.	3	COMS 3308, Bus. & Prof. Speech or COMS 2300, Public Speaking	3
AGRO 3421, Fund. Prin. Genetics	4	Humanities or Fine Arts	3
Group A course	3	Group A course	3
Group B course	3	Group B course	6
	<u>16</u>		<u>16</u>

Group A—Select 9 hours from the following: atmospheric science, biology, chemistry, geology, mathematics, physics.

Group B—Select 15 hours from the following: AGRO 3321, 3322, 3323, 3324, 4321, 4331, 4332, 4335 or 4421.

application of biological, chemical, and physical sciences with regard to natural and man-affected environments.

Horticulture today is the application of basic scientific information to the growing and use of edible (fruits, nuts, and vegetables) and ornamental plants (annual and perennial flowers and woody plants). Today's horticulture students focus on the challenges and practices of genetics and breeding, propagation, biotechnology, production, management, handling and storage, marketing, and use of horticultural plants.

Entomology is a broad-applied biological science. Entomology students study insect identification, ecology, genetics, physiology and genetic engineering, and the dynamic role of insects in virtually all of the ecosystems of the world.

Students in the areas of applied biology taught in the Department of Agronomy, Horticulture, and Entomology are educated to meet the challenges of efficiently producing plants for food, fiber, and aesthetic beauty while preserving our natural resources and environmental integrity. Graduates serve in a vast array of responsible positions in private industry, as well as with local, state, and federal agencies.

Agronomy, Industry and Management Emphasis.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGRO 1321, Agr. Plant Sci.	3	AECO 2305, Fund. Ag. Eco. or	
CHEM 1307, Prin. of Chem. I	3	ECO 2301, Prin. of Econ.	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	BIOL 1401, Biol. of Plants	4
MATH 1320, College Alg. or		CHEM 1308, Prin. of Chem. II	3
MATH 1330, Intro. Math. Anal.	3	CHEM 1104, Prin. of Chem. II (Lab.)	1
ENGL 1301, Ess. College Rhetoric	3	ENGL 1302, Adv. College Rhetoric	3
ENTO 2401, Intro. Ento.	4	MATH 1350, Analytical Geometry	3
	<u>17</u>		<u>17</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
HIST 2300, U.S. to 1877	3	HIST 2301, U.S. since 1877	3
POLS 1301, Am. Govt. Org.	3	POLS 2302, Am. Pub. Pol.	3
ENGL 2309, Rpts. & Corresp. or		AGRO 2432, Prin. & Prac. Soils	4
ENGL 3365, Prof. Rpt. Writ.	3	AGRO 2321, Crop, Growth, & Cul.	3
CHEM 3303, Intro. Org. Chem.	3	P.E., Band, ROTC, or Nutr.	1
CHEM 3103, Intro. Org. Chem. Lab.	1	Elective	3
AGSC 2300, Comp. in AG.	3		<u>17</u>
P.E., Band, ROTC, or Nutr.	1		
	<u>17</u>		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
AGRO 3321, Forage & Pasture Crops	3	BOT 3401, Plant. Phys.	4
AGRO 3322, Grain, Fiber, & Oil	3	AGRO 3323, Crop Ecol.	3
COMS 3308, Bus. & Prof. Speech Com.		MBIO 3400, Microbiology	4
or COMS 2300, Public Speaking	3	AECO 3401, Ag. Stats	4
HORT 4315, Ag. Biotech	3	Humanities or Fine Arts	3
Humanities or Fine Arts	3		<u>18</u>
Elective	2		
	<u>17</u>		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
AGRO 3421, Genetics	4	AGRO 4100, Seminar	1
AGRO 4421, Chem. Weed Control	4	AGRO 4321, Plant Breeding	3
AGRO 4335, Soil Fert.	3	ENTO 3305, Field Crop Ento. or	
BOT 3302, Plant Path.	3	ENTO 4301, Ag. Compounds	3
Elective	2	AGRO 3324, Seed Science	3
	<u>16</u>	AGRO 4331, Soil & Water Cons. or	
		AGRO 4332, Soil Classification	3
		Elective	2
			<u>15</u>

Directed elective: Choose from ANSC 1301, ATMO 1300, MCAG 2302, 3302, R&WM 2302.

Horticulture, Science Emphasis.

<i>Fall</i>		FIRST YEAR		<i>Spring</i>	
HORT 1411, Prin. of Hort.	4	AECO 2305 or ECO 2305	3		
CHEM 1307, Prin. of Chem. I	3	BIOL 1401, Biol. of Plants	4		
CHEM 1103, Prin. of Chem. I (lab.)	1	CHEM 1308, Prin. of Chem. II	3		
MATH 1320, Coll. Alg.	3	CHEM 1104, Prin. Chem. II (lab.)	1		
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3		
AGSC 2300, Comp. in Ag.	3	MATH 1330, Intro. Math. Anal.	3		
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1		
	<u>18</u>		<u>18</u>		

<i>Fall</i>		SECOND YEAR		<i>Spring</i>	
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3		
POLS 1301, Amer. Govt., Org.	3	HORT 2312, Propagation Meth.	3		
ENGL 2309, Pat. & Rept. Cor.	3	AGRO 2432, Prin. & Pract. Soils	4		
ENTO 2401, Intro. Ento.	4	POLS 2302, Amer. Pub. Pol.	3		
CHEM 3303, Intro. Org. Chem.	3	COMS 2300 or COMS 3308	3		
CHEM 3103, Intro. Org. Chem. (lab.)	1		<u>16</u>		
	<u>17</u>				

<i>Fall</i>		THIRD YEAR		<i>Spring</i>	
MBIO 3400, Microbiology	4	AGRO 3323, Crop Ecology	3		
BOT 3302, Plant Pathology	3	AGRO 3421, Genetics	4		
Humanities or Fine Arts	3	BOT 3401, Plant Physiology	4		
Group A course	3	Humanities or Fine Arts	3		
Group B course	3	Group A course	3		
	<u>16</u>		<u>17</u>		

<i>Fall</i>		FOURTH YEAR		<i>Spring</i>	
HORT 4421, Prin. Floriculture	4	ENTO 4301, Ag. Compounds	3		
AECO 3401, Ag. Stats.	4	HORT 4313, Arboriculture	3		
HORT 4100, Seminar	1	HORT 4315, Ag. Biotech.	3		
Group B course	3	Group B course	3		
Elective	4	Elective	4		
	<u>16</u>		<u>16</u>		

Group A courses—Select 6 hours from the following: AGRO 4335; BOT 3304; ENTO 3304; HORT 2311, 2313, 2314, 3317.

Group B courses—Select 9 hours from the following: AGRO 3324, 4321, HORT 3311, 3313, 3314, 3315, 3316, 3318, 4000.

Horticulture, Industry and Management Emphasis.

<i>Fall</i>		FIRST YEAR		<i>Spring</i>	
HORT 1411, Prin. of Hort.	4	ENGL 1302, Adv. Coll. Rhetoric	3		
CHEM 1307, Prin. Chem. I	3	BIOL 1401, Biol. of Plants	4		
CHEM 1103, Prin. Chem. I (lab.)	1	CHEM 1308, Prin. Chem. II	3		
MATH 1320, Coll. Alg.	3	CHEM 1104, Prin. Chem. II (lab.)	1		
ENGL 1301, Ess. Coll. Rhetoric	3	MATH 1330, Intro. Math. Anal.	3		
AECO 2305 or ECO 2305	3	P.E., Band, ROTC, or Nutr.	1		
P.E., Band, ROTC, or Nutr.	1		<u>15</u>		
	<u>18</u>				

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
ENGL 2309, Pat. & Rep. Cor.	3	HIST 2301, Hist. of U.S. since 1877	3
AGSC 2300, Comp. in Ag.	3	ENTO 2401, Intro. Ento.	4
HIST 2300, Hist. of U.S. to 1877	3	AGRO 2432, Prin. & Pract. Soils	4
POLS 1301, Amer. Govt. Org.	3	COMS 2300 or COMS 3308	3
HORT 2312, Propagation Meth.	3	POLS 2302, Amer. Pub. Pol.	3
Humanities or Fine Arts	3		17
	<u>18</u>		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
MKT 3350, Intro. Mkt.	3	AGRO 3421, Genetics	4
ACCT 2303, Using Acct. Info.	3	MGT 3370, Org. & Mgt.	3
MCAG 2302, Ag. Sur. & Land Con.	3	MBIO 3400, Microbiology	4
AGRO 3323, Crop Ecology	3	Group A course	3
Humanities or Fine Arts	3	Group B course	3
Group A course	3		17
	<u>18</u>		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
HORT 4100, Seminar	1	ENTO 4301, Ag. Compounds	3
BLAW 3391, Bus. Law I	3	HORT 4315, Ag. Biotech.	3
BOT 3302, Plant Path.	3	BOT 3401, Plant Phys.	4
Group B course	3	Group A course	3
Elective	5	Group B course	3
	<u>15</u>		16

Group A courses—Select 9 hours from the following: HORT 2311, 2313, 2314, 3317, 4313, 4314, 4411.
Group B courses—Select 9 hours from the following: AGRO 4321, 4421, ENTO 3304, HORT 3311, 3313, 3314, 3315, 3318, 4000.

Entomology.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ENTO 2401, Introductory Ento.	4	AECO 2305, Fund. Ag. Economics	3
ENGL 1301, Ess. College Rhetoric	3	ENGL 1302, Adv. College Rhetoric	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. after 1877	3
BIOL 1403, Biology I	4	BIOL 1404, Biology II	4
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>15</u>	Humanities or Fine Arts	3
			17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
MATH 1330, Intro. Math. Analysis or		MATH 1331, Intro. Math. Analysis or	
MATH 1320, College Algebra	3	MATH 1330, Intro. Math. Analysis	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
ENGL 2309, Technical Writing	3	COMS 3308, Bus. & Prof. Speech or	
POLS 1301, Amer. Gov., Org.	3	COMS 2300, Public Speaking	3
ENTO 3304, Hort-Urban Ento.	3	POLS 2302, Amer. Public Politics	3
	<u>16</u>	Humanities or Fine Arts	3
			16

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 3303, Intro. Organic Chem.	3	BOT 3401, Plant Physiology	4
CHEM 3103, Intro. Org. Chem. Lab.	1	ENTO 3307, Insect Physiology	3
MBIO 3400, Microbiology	4	ENTO 4304, Immatures	3
ENTO 3401, Insect Taxonomy	4	AGSC 2300, Computers in Agric.	3
ENTO 3305, Field Crop Ento.	3	Directed elective	3
Directed elective	3		16
	<u>18</u>		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
BOT 3302, Plant Pathology	3	AGRO 3421, Genetics	4
ENTO 4305, Integrated Pest Mgt.	3	ENTO 4301, Agric. Compounds	3
AECO 3401, Ag. Statistics or		HORT 4315, Agric. Biotechnology	3
MATH 2300, Statistical Math.	3-4	Directed elective	8
ENTO 4100, Seminar	1		18
Directed elective	7-8		
	<u>18</u>		

Directed electives:

A. Select 22 hours from the following: AGRO 1321, 2321, 2432, 3321, 3322, 3323, 3324, 4321, 4421; ENTO 3406; HORT 1311, 2311, 3311, 3318; R&WM 3302.

B. BIOL 3303, 3307, 4305, 4306, ZOOL 3406, 4312, ATMO 1300-1100.

C. ACCT 2300; BLAW 3391, 3392; FIN 2320; MGT 3370, 3371; MKT 3350, 4351.

Courses in Agronomy. (AGRO)

- 1321. Agronomic Plant Science (3:3:0).** Importance, distribution, and use of major world agronomic crops. Fundamentals of growth, structure, and improvements are also stressed.
- 2231. Introductory Urban Soils (2:2:0).** Development and utilization of nonagricultural soils with emphasis on physical properties for urban uses. Open to PALA majors only. (Credit not given for AGRO 2432.)
- 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.
- 2432. Principles and Practices in Soils (4:3:2).** Prerequisite: CHEM 1305, 1306, 1101, 1102, or CHEM 1307, 1308, 1103, 1104. Formation and composition, physical and chemical properties, hydraulic and thermal relationships of soil. Role of soil in ecosystems.
- 3321. Forage and Pasture Crops (3:3:0).** The production and use of forage and pasture crops.
- 3322. Grain, Fiber, and Oilseed Crops (3:3:0).** History, distribution, use, plant form, growth and development, and cultural and production practices of important agronomic crops.
- 3323. Crop Ecology (3:3:0).** Prerequisite: AGRO 1321. The effect of edaphic, climatic, and environmental factors on crop adaptation and production.
- 3324. Seed Science (3:2:2).** 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: AGRO 1321 or BIOL 1401 or consent of instructor. Heredity and variation. The chromosome theory in plants and animals. Biometry as applied to genetic data.
- 4000. Internship (V1-3).** Prerequisite: Approval of department chairperson. A supervised study course providing in-service training and practice in various areas. May be repeated for credit.

- 4001. Problems (V1-3).** Prerequisite: Approval of instructor. An assigned problem and individual instruction. May be repeated for credit with approval of department chairperson.
- 4100. Seminar (1:1:0).** Prerequisite: Senior standing or approval of instructor. Assigned readings, current advances in agronomy, informal discussions, oral reports, and papers. May be repeated.
- 4321. Fundamental Principles of Plant Breeding (3:3:0).** Prerequisite: AGRO 3421. Practical application of genetics in the breeding and improvement of plants.
- 4325. Crop Water Management (3:3:0).** Comprehensive evaluation of soil-plant atmosphere interactions affecting supply and demand of water for crop production.
- 4331. Soil and Water Conservation (3:2:3).** Prerequisite: AGRO 2432. Factors affecting wind and water erosion; soil and water conservation practices; planning for optimum land use.
- 4332. Soil Classification (3:2:3).** Prerequisite: AGRO 2432, or approval of instructor for nonagriculture majors. Soil profile morphology. Classification systems with emphasis on the taxonomic system of the United States.
- 4335. Soil Fertility Management (3:3:0).** Prerequisite: AGRO 2432. Nutrient availability as influenced by the properties of soils, use of fertilizers and soil amendments; methods and time of application of fertilizer.
- 4421. Chemical Weed Control (4:3:2).** Fundamentals of chemical weed control. Emphasis on herbicide families, names, usage, absorption, translocation, mechanism of action, and factors influencing selectivity and soil persistence. The laboratory will emphasize labels, calculations, equipment, calibrations and usage, and methods of application.

Courses in Entomology. (ENTO)

- 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. F.
- 2401. Introductory Entomology (4:3:2).** An introduction to the arthropods with major emphasis on the insects. Insect structure, function, identification, and relationships to man, plants, and animals will be discussed.
- 3304. Horticultural and Urban Arthropod Pests (3:2:2).** Prerequisite: ENTO 2401. The life history, biology, and management of arthropod pests of ornamental, vegetable, and fruit crops and of households and industry. F.
- 3305. Field Crop Entomology (3:2:2).** Prerequisite: ENTO 2401. Introduction to insects of agricultural importance, their identification, and management strategies. Pest sampling and recognition of damage to major crops will also be discussed. F.
- 3307. Insect Anatomy and Physiology (3:2:3).** Prerequisite: ENTO 2401. A study of the structure and function of insect systems. S.
- 3401. Insect Taxonomy (4:3:3).** Prerequisite: ENTO 2401 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. F.
- 3402. Medical and Veterinary Entomology (4:3:2).** Prerequisite: ENTO 2401. The life history and management tactics of arthropod pests associated with livestock and human diseases. S.
- 4000. Internship (V1-12).**
- 4001. Entomology Problems (V1-6).** 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. F, S, SS.
- 4100. Seminar (1:1:0).** Prerequisite: Senior standing or approval of instructor. Assigned readings, current advances in entomology, informal discussions, oral reports and papers. May be repeated.

- 4301. Agricultural Compounds (3:3:0).** Prerequisite: ENTO 2401 and CHEM 3401. Nature, mode of action, and uses of insecticides, fungicides, herbicides, and other pesticides. S, SSL.
- 4303. Insect Natural History (3:2:2).** A field oriented study of insect habitats and behavior with emphasis on entomological techniques. SSL, even years.
- 4304. Immature Insects (3:2:3).** Prerequisite: ENTO 2401 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. S.
- 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. F.

Courses in Horticulture. (HORT)

- 1411. Principles of Horticulture (4:3:2).** Fundamental principles and practices of growth, structure, nomenclature, scientific method, and the use of horticultural plants.
- 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 (3:2:2).** Prerequisite: HORT 1411. Propagation techniques of commercial nurseries and greenhouse ranges; study of the physiological reaction and cutting material.
- 2313. Herbaceous Plant Materials (3:2:2).** Prerequisite: HORT 1411. Study of the principal herbaceous plants and plant families, palms, roses, and subtropic landscape plants.
- 2314. Woody Plants (3:2:2).** Prerequisite: HORT 1411. Discussion and selection of woody plants used for ornamental purposes in the landscape setting. The course will be divided between deciduous and evergreen plants.
- 3311. Tree Fruit Culture (3:3:0).** Principles of fruit culture with emphasis on variety selection, pruning techniques, and propagation methods.
- 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: HORT 1411 and 2314. Aimed at providing sufficient background in plant physiological principles 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.
- 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.
- 3319. Advanced Viticulture I (3:2:3).** Prerequisite: HORT 3318. Production regions, cultural practices, harvest and handling, marketing and usage of grapes.
- 4000. Internship (V1-3).** Prerequisite: Approval of department chairperson. A supervised study course providing in-service training and practice in various areas. May be repeated for credit.
- 4001. Problems (V1-3).** Prerequisite: Approval of instructor. An assigned problem and individual instruction. May be repeated for credit with approval of department chairperson.
- 4100. Seminar (1:1:0).** Prerequisite: Senior standing or approval of instructor. Assigned readings, current advances in horticulture, informal discussion, oral reports, and papers. May be repeated.

4313. **Arboriculture (3:3:0).** Prerequisite: HORT 1411. The physiological principles and industry practices in the production, moving, care, and maintenance of ornamental trees, shrubs, and ground covers. Required field trips.
4314. **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.
4315. **Agricultural Biotechnology (3:2:2).** Biotechnology applied to agricultural species, (plants, animals, and insects). Topics will include micropropagation, tissue culture, gel electrophoresis, transformation theory, and practice.
4316. **Advanced Viticulture II (3:2:3).** Prerequisite: HORT 3319. Physiological, chemical, anatomical factors affecting grape culture.
4411. **Principles of Floriculture (3:2:3).** Greenhouse construction, heating and cooling, growing media, pest management, nutrition and fertility, growth regulation, irrigation, post harvest handling, and marketing of floricultural crops. Required field trips.

Department of Animal Science

Professor R. A. Long, Chairperson.

Thornton Professor Preston; Professors Albin, Curl, Ramsey, and Richardson; Associate Professors Clark, McGlone, and Miller; Assistant Professor Green; Lecturers Hellman and Jackson; Adjunct Professor Buddingh; Visiting Assistant Professors Pipkin and Thompson.

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 ANIMAL SCIENCE.

Animal business blends business and economics with animal science courses in preparation for careers in all facets of livestock production and subsidiary support services. Animal production provides the latest principles in efficient livestock production, marketing, and processing. The ranch management specialization integrates animal science, economics, and range and wildlife courses in preparation for successful ranch management positions. The teaching specialization is designed for those students wanting to complete a degree in animal production and also certify to teach agricultural sciences in secondary education. The animal science curriculum provides training in advanced basic sciences in preparation for study toward an advanced degree. The department requires a grade of C or higher in all Animal Science courses that are required for graduation.

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**

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AECO 2305, Fund. Ag. Eco.	3
ANSC 1301, Gen. Anim. Sci.	3	CHEM 1306, Chemistry & Society II	3
CHEM 1305, Chemistry & Society I	3	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	ANSC 2301, Lvstk. & Meat Eval. I	3
MATH 1320 or 1330	3	MATH 1321 or 1331	3
*Basic agriculture	3	P.E., Band, ROTC, or Nutr.	1
	<u>17</u>		<u>17</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
AECO 2306, Prin. Mkt. Ag. Prod.	3	AECO 3302, Ag. Finance	3
ANSC 2401, Anat. & Phys. Dom. An.	4	POLS 1301, Amer. Pub. Pol.	3
ACCT 2300, Elem. Acct. I	3	BIOL 1402, Biol. of Animals	4
CHEM 3303, Intro. Org. Chem.	3	HIST 2300, Hist. of U.S. to 1877	3
CHEM 3103, Intro. Org. Chem. Lab.	1	*Basic Agriculture	3
ENGL 2309, Patt. of Reports	3	P.E., Band, ROTC, or Nutr.	1
	<u>17</u>		<u>17</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 3401, Repro. Physiol.	4	AECO 3401 or ISQS 2445	4
ANSC 3201, Sel., Proc. Meats	2	ANSC 3307, Feeds & Feeding	3
ANSC 3101, Sel., Proc. Meats Lab.	1	POLS 2302, Amer. Pub. Pol.	3
ANSC 3301, Prin. Nutr.	3	HIST 2301, Hist. of U.S. Since 1877	3
COMS 2300 or 3308	3	ANSC 3402, Anim. Brd. & Genetics	4
AECO 3304, Farm & Ranch Mgmt.	3		<u>17</u>
	<u>16</u>		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 4100, Anim. Sci. Seminar	1	ANSC 4302, 4306, or 4402	3-4
ANSC 4401, Swine Prod.	4	ANSC 4308, Beef Prod.	3
AECO 3303, 3305, 3314, 4303, or 4317	3	Electives	<u>9-10</u>
BLAW 3391, Bus. Law I	3		<u>15-17</u>
**Humanities or Fine Arts	6		
	<u>17</u>		

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

*See Courses for Freshman Year.

**Select 6 hours from General Education Requirements.

Animal Production Curriculum.**FIRST YEAR**

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AECO 2305, Fund. Ag. Eco.	3
ANSC 1301, Gen. Anim. Sci.	3	CHEM 1306, Chemistry & Society II	3
CHEM 1305, Chemistry & Society I	3	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	ANSC 2301, Lvstk. & Meat Eval. I	3
MATH 1320 or 1330	3	MATH 1321 or 1331	3
*Basic Agriculture	3	P.E., Band, ROTC, or Nutr.	1
	<u>17</u>		<u>17</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	AGRO 2432, 3321, or R&WM 3303	3-4
ANSC 2401, Anat. & Phys. Dom. An.	4	POLS 2302, Amer. Pub. Pol.	3
CHEM 3303, Intro. Org. Chem.	3	BIOL 1402, Biol. of Animals	4
CHEM 3103, Intro. Org. Chem. Lab.	1	HIST 2300, Hist. of U.S. to 1877	3
ENGL 2309, Patt. of Reports	3	P.E., Band, ROTC, or Nutr.	1
*Basic Agriculture	3	**Humanities or Fine Arts	3
	17		17-18

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 3401, Repro. Physiol.	4	MBIO 3400, Microbiology	4
ANSC 3201, Sel., Proc. Meat	2	ANSC 3307, Feeds & Feeding	3
ANSC 3101, Sel., Proc. Meat Lab.	1	ANSC 3306, Anim. Diseases	3
ANSC 3301, Prin. Nutr.	3	HIST 2301, Hist. of U.S. since 1877	3
COMS 2300 or 3308	3	ANSC 3402, Anim. Brd. & Genetics	4
** Humanities or Fine Arts	3		17
	16		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 4100, Anim. Sci. Seminar	1	ANSC 4308, Beef Prod.	3
ANSC 4401, Swine Prod.	4	ANSC 4302, 4306, or 4402	3-4
†Approved Electives	12	Electives	8-10
	17		15-16

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

*See Courses for Freshman Year.

**Select 6 hours from General Education requirements.

†Select 12 hours from the following: ANSC 2302, 2303, 2304, 3202, 3203, 3204, 3205, 3303, 3308, 4000, 4202, 4300, 4301, 4302, 4303, 4306, 4402, AEEO 2306, 3302, 3303, 3304, 3305, 3314, 3401, 4303, 4317, AGRO 2432, 3321, 3322, 4421, or R&WM 3303.

Animal Production Curriculum, Ranch Management Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AEEO 2305, Fund. Ag. Eco.	3
ANSC 1301, Gen. Anim. Sci.	3	CHEM 1306, Chemistry & Society II	3
*Basic Agriculture	3	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
CHEM 1305, Chemistry & Society I	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	ANSC 2301, Lvstk. & Meat Eval. I	3
ENGL 1301, Ess. Coll. Rhetoric	3	MATH 1321 or 1331	3
MATH 1320 or 1330	3	P. E., Band, ROTC, or Nutr.	1
	17		17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	AGRO 2432, Prin. Pract. Soils	4
ANSC 2401, Anat. & Phys. Dom. An.	4	POLS 2302, Amer. Pub. Pol.	3
CHEM 3303, Intro. Org. Chem.	3	BIOL 1402, Biol. of Animals	4
CHEM 3103, Intro. Org. Chem. Lab.	1	HIST 2300, Hist. of U.S. to 1877	3
ENGL 2309, Patt. of Reports	3	ACCT 2300, Elem. Acct. I	3
*Basic Agriculture	3	P. E., Band, ROTC, or Nutr.	1
	17		18

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 3401, Repro. Physiol.	4	**Humanities or Fine Arts	3
AECO 2306, Prin. Mkt. Ag. Prod.	3	ANSC 3402, Anim. Brd. & Genetics	4
R&WM 3302, Range Plant Ecol.	3	HIST 2301, Hist. of U.S. since 1877	3
ANSC 3301, Prin. Nutr.	3	ANSC 3307, Feeds and Feeding	3
COMS 2300 or 3308	3	Electives	3-4
	<u>16</u>		<u>16-17</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 4100, Anim. Sci. Seminar	1	ANSC 4308, Beef Prod.	3
R&WM 4302, Range Improve.	3	ANSC 4306, Sheep, Wool, Mohair Prod.	3
AECO 3304, Farm and Ranch Mgmt.	3	R&WM 4303, Range Anal. & Mgt. Plan.	3
ANSC 4302, 4401, or 4402	3-4	†Approved Electives	7
ANSC 3201, Sel., Proc. Meat	2		<u>16</u>
ANSC 3101, Sel., Proc. Meat Lab.	1		
**Humanities or Fine Arts	3		
	<u>16-17</u>		

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

*See Courses for Freshman Year.

**Select 6 hours from General Education Requirements.

†Select 7 hours from ANSC 4202, 4300, 4302, 4303, 4401, 4402, AECO 3302, 3305, 3314, 4303, 4317, R&WM 3303, 4304, or 4309.

Animal Production Curriculum, Teaching Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AGRO 1321, Agro. Plant Sci.	3
ANSC 1301, Gen. Anim. Sci.	3	CHEM 1306, Chem. & Society II	3
MATH 1320 or 1330	3	CHEM 1102, Exp. Gen. Chem. II (Lab.)	1
CHEM 1305, Chem. & Society I	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	ANSC 2301, Lvstk. & Meat Eval. I	3
ENGL 1301, Ess. Coll. Rhetoric	3	MATH 1321 or 1331	3
P. E., Band, ROTC, or Nutr.	1		<u>16</u>
	<u>15</u>		

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt. Org.	3	AGRO 2432, Prin. & Pract. Soils	4
AECO 2305, Fund. Ag. Eco.	3	ANSC 2401, Anat. & Phys. Dom. An.	4
CHEM 3303, Intro. Org. Chem.	3	BIOL 1402, Biol. of Animals	4
CHEM 3103, Intro. Org. Chem. Lab.	1	ENGL 2309, Patt. of Reports	3
ENTO 2401, Intro. Ento.	4	P.E., Band, ROTC, or Nutr.	1
HIST 2300, Hist. of U.S. to 1877	3		<u>16</u>
	<u>17</u>		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 3401, Repro. Physiol.	4	MBIO 3400, Microbiology	4
ANSC 3201, Sel., Proc. Meat	2	ANSC 3307, Feeds & Feeding	3
ANSC 3101, Sel., Proc. Meat Lab.	1	ANSC 3306, Anim. Diseases	3
ANSC 3301, Prin. Nutr.	3	AGSC 2300, Computers in Ag.	3
POLS 2302, Amer. Pub. Pol.	3	ANSC 3402, Anim. Brd. & Genetics	4
MCAG 2301, Ag. Elec.	3		<u>17</u>
	<u>16</u>		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ENGL 2301 or 2307	3	ANSC 4308, Beef Prod.	3
ANSC 4401, Swine Prod.	4	ANSC 4302, 4306, or 4402	3-4
HIST 2301, U.S. since 1877	3	MCAG 2201, Welding & Metal Work	2
COMS 2300, Public Speaking	3	MCAG 3303, Small Gas Engines	3
AECO 3304, Farm & Ranch Mgmt.	3	AGED 2300, Intro. Ag. Sci. Dev.	3
	<u>16</u>		<u>14-15</u>

FIFTH YEAR

<i>Fall</i>		<i>Spring</i>	
AGED 3330, Int. Ag. Agy. Info. Sys.	3	(Student Teaching Block)	
EPSY 3330, Educ. Psychol.	3	AGED 4304, High School Methods	3
EDSE 3300, Fndts. Sec. Educ.	3	AGED 4306, Student Teaching	6
ANSC 4100, Anim. Sci. Seminar	1	EDSE 3321, Curr. Dev. Sec. Educ.	3
*Humanities or Fine Arts	3	AGSC 3301, Ag. Leadership Prin.	3
	<u>13</u>		<u>15</u>

Hours required for graduation, exclusive of P.E., Band, ROTC, or Nutrition—153.

*Select 3 hours from General Education Requirements.

Animal Science Curriculum.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AECO 2305, Fund. Ag. Eco.	3
ANSC 1301, Gen. Animal Sci.	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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	ANSC 2301, Lvstk. & Meat Eval. I	3
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	3
*Basic Agriculture	3	P. E., Band, ROTC, or Nutr.	1
	<u>17</u>		<u>17</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	*Basic Agriculture	3
ANSC 2401, Anat. & Phys. Dom. An.	4	POLS 2302, Amer. Pub. Pol.	3
CHEM 3305, Org. Chem.	3	CHEM 3306, Org. Chem.	3
CHEM 3105, Org. Chem. Lab.	1	CHEM 3106, Org. Chem. Lab.	1
ENGL 2309, Patt. of Repts.	3	HIST 2300, Hist. of U.S. to 1877	3
BIOL 1402, Biol. of Animals	4	P. E., Band, ROTC, or Nutr.	1
	<u>18</u>	**Humanities or Fine Arts	3
			<u>17</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 3401, Repro. Physiol.	4	ANSC 3307, Feeds and Feeding	3
ANSC 3201, Sel., Proc. Meat	2	HIST 2301, Hist. of U.S. since 1877	3
ANSC 3101, Sel., Proc. Meat Lab.	1	ANSC 3402, Anim. Brd. & Genetics	4
ANSC 3301, Prin. of Nutr.	3	AECO 3401, Ag. Statistics	4
AGRO 3421, Fund. Prin. Gen.	4	**Humanities or Fine Arts	3
COMS 2300 or 3308	3		<u>17</u>
	<u>17</u>		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ANSC 4401, Swine Prod.	4	ANSC 4100, Anim. Sci. Seminar	1
Electives	3	ANSC 4308, Beef Prod.	3
† Approved Electives	9	ANSC 4302, 4306, or 4402	3-4
	16	† Approved Electives	3
		Electives	4-5
			15-16

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

*See Courses for Freshman Year.

**Select 6 hours from General Education Requirements.

†Select 12 hours from the following: ANSC 3306, 3308, 4000, 4202, 4300, 4301, 4303, AGSC 2300, AGRO 2432, MBIO 3400, 3401, BIOL 3302, 3420, ZOOL 2405, 3401, 4304, 4306, 4312, 4409, PHYS 1306 & 1103, 1307 & 1104, CHEM 3402, 4303, 4306, 4307, plus other approved courses.

Preveterinary Medicine Curriculum.

The 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 University.

The minimum recommended preparation for application to the professional veterinary curriculum is 64 semester hours of acceptable university credit to include the following suggested sequence of courses.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
BIOL 1402, Biol. of Anim.	4	PHYS 1306, Gen. Phys.	3
CHEM 1307, Prin. Chem. I	3	PHYS 1103, Exp. Gen. Phys. I (Lab.)	1
CHEM 1103, Prin. Chem. I (Lab.)	1	CHEM 1308, Prin. Chem. II	3
ENGL 1301, Ess. Coll. Rhetoric	3	CHEM 1104, Prin. Chem. II (Lab.)	1
ANSC 1301, Gen. Anim. Sci.	3	ENGL 1302, Adv. Coll. Rhetoric	3
POLS 1301, Amer. Govt., Org.	3	MATH 1351, Calculus I	3
	17	POLS 2302, Amer. Pub. Pol.	3
			17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 3305, Org. Chemistry	3	ANSC 3301, Prin. of Nutr.	3
CHEM 3105, Org. Chem. Lab.	1	HIST 2301, Hist. of U.S. since 1877	3
ENGL 2309, Patt. of Repts.	3	MBIO 3401, Prin. of Micro.	4
AGRO 3421, Fund. Prin. of Genetics	4	BIOL 3420, Cell Biology	4
HIST 2300, Hist. of U.S. to 1877	3	PHYS 1307, Gen. Phys.	3
ENGL 2301, Master. of Lit.	3	PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
	17		18

Courses in Animal Science. (ANSC)

1301. General Animal Science (3:2:3). The application of basic scientific principles to the efficient production of domestic animals. F, S.
2301. Livestock and Meat Evaluation I (3:2:3). Prerequisite: ANSC 1301. Evaluation and selection of breeding and market animals, carcass evaluation and grading, breed characteristics. Field trips to ranches and meat packing plants. S.
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. F.

- 2303. Care and Management of Companion Animals (3:3:0).** Principles and practices of proper selection, feeding, and care of companion animals, with emphasis on the dog and cat. Nutrition, health care, behavior, training, and reproduction are discussed. F.
- 2304. Selection and Evaluation of Horses (3:2:3).** Prerequisite: Sophomore standing. 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. S.
- 2401. Anatomy and Physiology of Domestic Animals (4:4:0).** Prerequisite: ANSC 1301. Introduction to anatomy and physiology of domestic animals. The anatomy and physiology of the nervous, skeletal, muscular, circulatory, digestive, urinary, reproductive, and endocrine systems. F, S.
- 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. F, S.
- 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. F, S.
- 3202. Horse Judging and Selection (2:0:4).** Prerequisite: ANSC 2304. 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. F.
- 3203. Livestock and Meat Judging (2:0:6).** Prerequisite: ANSC 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. S.
- 3204. Advanced Livestock and Meat Judging (2:0:6).** Prerequisite: ANSC 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. F.
- 3205. Management and Training of Horses (2:0:4).** Prerequisite: ANSC 3303 or 4309, and consent of instructor. A practicum on routine techniques of handling and training horses of various ages. S.
- 3301. Principles of Nutrition (3:3:0).** Prerequisite: ANSC 1301, CHEM 3303 and 3103. Nutritional roles of carbohydrates, proteins, lipids, minerals, vitamins, and water. Digestion, absorption, and use of nutrients and their metabolites. F, S.
- 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. F.
- 3303. Introductory Horse Management (3:3:0).** An introduction to breeding, feeding, stabling, and shoeing of horses. Gaits. Care of stallions, mares, and foals. Parasites and diseases. F.
- 3305. Applied Animal Nutrition (3:3:0).** Prerequisite: ANSC 1301, 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 3307. F, SSI.
- 3306. Animal Diseases (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. S.
- 3307. Feeds and Feeding (3:2:2).** Prerequisite: ANSC 3301, CHEM 3303, 3103, or 3305, 3105. Characteristics of feedstuffs used in livestock enterprises. Ration formulation and nutritional management of beef and dairy cattle, sheep, goats, swine, and horses. Methods of processing and evaluating feeds. S.
- 3308. Domestic Animal Behavior (3:2:3).** Prerequisite: ANSC 2401 or consent of instructor. Presentation of classic and recent findings in applied animal behavior. Laboratory includes observing and measuring behavior in farm animals. S.

- 3401. Reproductive Physiology (4:3:3).** Prerequisite: ANSC 2401. Physiological approach to reproductive processes in farm animals. Study includes anatomy, endocrinology, estrous cycles, egg and sperm physiology, fertilization, gestation, parturition, and artificial insemination. F.
- 3402. Animal Breeding and Genetics (4:3:2).** Prerequisite: MATH 1320. Fundamental principles of cellular, population, and quantitative genetics applied in selection and mating systems to make genetic improvements in farm animals. Majors only. F, S.
- 4000. Internship (V1-12).** Prerequisite: Consent of department chairperson. A supervised study course providing in-service training and practice in the various areas of animal science. F, S, SS.
- 4100. Animal Science Seminar (1:1:0).** Assigned subjects. Review of recent investigations. Reports and discussions. May be repeated once for credit. F, S.
- 4202. Artificial Insemination of Livestock (2:1:3).** Prerequisite: ANSC 3401 and consent of instructor. Anatomy and physiology of reproductive organs, palpation, insemination techniques, handling frozen semen, estrous detection, synchronization of estrus and ovulation, and pregnancy determination. S.
- 4300. Microcomputer Applications in Animal Science (3:1:4).** Prerequisite: AGSC 2300 or consent of instructor. Application of microcomputer technology to solving problems commonly confronted in the livestock and meat industries. S, SSI.
- 4301. Special Problems in Animal Science (3).** Prerequisite: Senior standing and approval of department chairperson. Individual investigation. May be repeated for credit. F, S, SS.
- 4302. Beef Cattle Feedyard Management (3:3:0).** Prerequisite: ANSC 3301 and junior or senior standing. The analysis of feedyard operations—design, economics, projections, bank relationships, procurement, and marketing. Customer relations and commodity hedging techniques. F, S.
- 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. F.
- 4306. Sheep and Angora Goat Production (3:2:3).** Prerequisite: ANSC 3307, 3401, and 3402 (majors only) or consent of instructor; may take only one of above concurrently. Sheep, Angora goat, wool, and mohair production management and marketing practices. Field trips to ranches and feedlots. S.
- 4308. Beef Production (3:2:2).** Prerequisite: ANSC 3307, 3401, and 3402 (majors only) or consent of instructor; may take only one of above concurrently. 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. S.
- 4401. Swine Production (4:3:2).** Prerequisite: ANSC 3307, 3401, and 3402 (majors only) or consent of instructor; may take only one of the above concurrently. Understanding pig biology and management of the pigs' environment and genetics to maximize profits. Topics include genetics, nutrition, reproduction, housing, herd health and management practices. Laboratory and field trips. F.
- 4402. Horse Production (4:3:2).** Prerequisite: ANSC 3307, 3401, 3402, (majors only) or consent of instructor. An advanced study of equine nutrition, reproduction, genetics, feeding and breeding management, herd health, and marketing principles. S.

Food Technology

Professor R. A. Long, Chairperson.

Professor Ramsey; Associate Professor Miller; Visiting Assistant Professor Thompson.

The Food Technology section supervises the following degree programs: FOOD TECHNOLOGY, *Bachelor of Science* and *Master of Science*. Two areas of

specialization are offered—science and industry. 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, Science Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AECO 2305, Fund. 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 or 1351	3	ENGL 1302, Adv. Coll. Rhetoric	3
CHEM 1307, Prin. Chem. I	3	**Basic Agriculture	3
CHEM 1103, Prin. Chem. I (Lab.)	1	ANSC 1301, Gen. Anim. Science	3
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>16</u>		<u>17</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 3305, Org. Chem.	3	†Advanced Chem.	4
CHEM 3105, Org. Chem. Lab.	1	PHYS 1306, Gen. Physics	3
MATH 1331 or 1352	3	PHYS 1103, Exp. Gen. Phys. I (Lab.)	1
FD T 2300, Prin. Food Tech.	3	FD T 2302, Elem. Anal. Foods	3
COMS 2300 or 3308	3	HIST 2301, Hist. of U.S. since 1877	3
HIST 2300, Hist. of U.S. to 1877	3	††Humanities or Fine Arts	3
ENGL 2309, Patt. of Repts.	3		17
	<u>19</u>		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	CHEM 2401, Anal. Chem. Meth.	4
F&N 3340, Human Nutrition	3	POLS 2302, Amer. Pub. Pol.	3
FD T 3302, Adv. Food Anal. or FD T 4303	3	FD T 3301, Food Microbiology or FD T 4305	3
MBIO 3400, Microbiology	4	††Approved science elective	6
††Approved elective	3	FD T 3303, Food Sanitation	3
	<u>16</u>		<u>19</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
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	††Approved elective	3
††Approved science elective	3	Elective	5
†Humanities or Fine Arts	3		14
	<u>16</u>		

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

*Meets Institute of Food Technologists' requirements.

**See Courses for Freshman Year.

†Select 6 hours from General Education Requirements.

††Consult major advisor.

Food Technology Curriculum, Industry Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 1111, The Ag. Industry	1	AECO 2305, Fund. Ag. Eco.	3
BIOL 1402, Biol. of Animals	4	**CHEM 1305 or 1307	3
ENGL 1301, Ess. Coll. Rhetoric	3	**CHEM 1101 or 1103	1
MATH 1320 or 1330	3	ENGL 1302, Adv. Coll. Rhetoric	3
*Basic agriculture	3	MATH 1321 or 1331	3
ANSC 1301, Gen. Anim. Science	3	*Basic agriculture	3
	<u>17</u>	P.E., Band, ROTC, or Nutr.	1
			<u>17</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
**CHEM 1306 or 1308	3	CHEM 3303, 3103, or 3305, 3105	4
**CHEM 1102 or 1104	1	HIST 2301, Hist. of U.S. since 1877	3
FD T 2300, Prin. Food Tech.	3	ENGL 2309, Patt. of Repts.	3
HIST 2300, Hist. of U.S. to 1877	3	FD T 2302, Elem. Anal. of Foods	3
†Humanities or Fine Arts	3	††Approved elective	3
††Approved elective	3	P.E., Band, ROTC, or Nutr.	1
	<u>16</u>		<u>17</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	ACCT 2300, Elem. Acct. I or Adv. Chem.	34
F&N 3340, Human Nutrition	3	ANSC 3201 and 3101 or HORT 2311	3
FD T 3304, Fruit & Veg. Proc.	3	†Humanities or Fine Arts	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
	<u>16</u>	††Approved elective	3
			<u>18-19</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
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	3	COMS 2300 or 3308	3
FD T 3303, Food Sanitation	3	Electives	7-8
Elective	3		16-17
	<hr/> 16		

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

*See Courses for Freshman Year.

**A student planning to take additional chemistry courses other than CHEM 3303 and 3103 should take CHEM 1307, 1103 and 1308, 1104.

†Select 6 hours from General Education 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. F, S.
- 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. S.
- 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. S, even years.
- 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. F, even years.
- 3303. Food Sanitation (3:3:0).** Principles of sanitation in food processing and food service applications. Chemical, physical, and microorganic bases of sanitation. Equipment and food product care. F, S.
- 3304. Fruit and Vegetable Processing (3:2:3).** Practice in preserving fruits and vegetables. Suitable for nonmajors. F.
- 4301. Food Technology Problems (3).** Taught on an individual basis. May be repeated for credit with permission. F, S, SSI.
- 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. F, odd years.
- 4304. Field Studies in Food Processing and Handling (3:1:4).** Visits to food processing and handling facilities and discussions of operations. F.
- 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. S, odd years.
- 4306. Dairy Products Manufacturing (3:2:3).** Physical and chemical characteristics of milk and milk products. Principles involved in processing dairy foods. S.

Department of Park Administration and Landscape Architecture

Professor Thomas A. Musiak, Chairperson.

Professors Fish and Mertes; Associate Professor Marlett; Assistant Professors Billing, Goddard, and Kavanagh; Instructor Grant.

This department supervises the following degree programs: PARK ADMINISTRATION, *Bachelor of Science*; LANDSCAPE ARCHITECTURE, *Bachelor of Landscape Architecture*; LAND-USE AND RESOURCE PLANNING, *Master of Science*. Offices and most classroom facilities are located in the Plant Science Building and the Landscape Architecture Pavilion.

The park administration program offers specializations in park management and resource management. Studies are directed toward developing an understanding and acquiring an expertise in planning, designing, and managing parks and other open spaces as integral parts of the living environment. Participation in a departmentally sponsored internship 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 architecture profession in either the public or the private sector. This program emphasizes physical design and planning in the natural and urban environment. Landscape architecture students are urged to intern in the offices of registered landscape architects, planners, and associated professionals in the summer prior to their last year.

Students entering the program will be admitted provisionally. Due to space limitations, a maximum of 30 students will be admitted to PALA 3401 and the remainder of the program based on cumulative GPA at the end of the previous semester.

The department is a member of the Council of Educators in Landscape Architecture, and the curriculum in landscape architecture is accredited by the American Society of Landscape Architects.

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 Association for Environmental Education, and the Texas Chapter of 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 administers a scholarship program for students with potential for high academic performance. Contact the department for information and scholarship application forms.

Park Administration—Park Management Option.**FIRST YEAR**

<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1320, Coll. Algebra	3	GEOL 1303, Phys. Geol.	3
HORT 1311, Prin. Hort.	3	GEOL 1101, Phys. Geol. Lab.	1
PALA 1301, Fund. Park Plan.	3	PALA 3306, Graphics I	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
P.E., Band, ROTC, or Nutr.	1	Math. or logic elective	3
	<u>16</u>	P.E., Band, ROTC, or Nutr.	<u>1</u>
			17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Govt. Pol.	3
PALA 3301, Basic Park Admin.	3	HORT 2314, Woody Plant Mats.	3
HORT 2313, Herb. Plant Mats.	3	PALA 2401, Land. Arch. I	4
AGRO 2231, Intro. Urban Soils	2	PALA 2301, Resource Interp.	3
RLS 2309, Outdoor Rec. Mgt.	3	ENGL 2309, Patt. of Reports	<u>3</u>
Humanities or fine arts	<u>3</u>		16
	17		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ECO 2305, Prin. of Eco. or AECO 2305, Fund. of Ag. Eco.	3	HORT 3315, Grounds Maint. & Opr.	3
ENTO 2301, Intro. Ento.	3	MCAG 2302, Ag. Surv. & Land. Con.	3
PALA 2402, Land. Arch. II	4	POLS 3342, Personnel Admin.	3
P R 3310, Prin. Pub. Rel.	3	ENGL 3365, Prof. Report Writing	3
POLS 3321, Local Govt.	3	Oral Comm. Elective	<u>3</u>
	<u>16</u>		15

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
PALA 4302, Land & Water Res.	3	PALA 3304, L.A. Des. Impl. I	3
PALA 4304, Watershed Mgt.	3	PALA 4303, Land Res. Prot. Strat.	3
PALA 4305, Rev. Prod. Act.	3	PALA 4403, Aerial Photo.	4
PALA 4100, Seminar	1	PALA 4202, Park Admin.	2
Ind. or group behavior elect.	3	Elective	3
HORT 3313, Turfgrass Mgmt.	<u>3</u>	HORT 4313, Arboriculture	<u>3</u>
	16		18

Hours required for graduation exclusive of P.E., Band, ROTC, or Nutrition—129.

Park Administration—Resource Management Option.**FIRST YEAR**

<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1320, Coll. Algebra	3	GEOL 1303, Phys. Geol.	3
HORT 1311, Prin. of Hort.	3	GEOL 1101, Phys. Geol. Lab.	1
PALA 1301, Fund. Park Plan.	3	PALA 3306, Graphics I	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>16</u>	Math. or logic elect.	<u>3</u>
			17

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SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
PALA 3301, Basic Park Admin.	3	ECO 2305, Prin. of Eco. or	3
Elective	3	AECO 2305, Fund. of Ag. Eco.	3
Humanities or fine arts	3	PALA 2401, Land. Arch. I	4
PALA 2301, Basic Natl. & Cul.		ENGL 2309, Patt. of Repts.	3
Resource Interp.	3	Ind. or group behavior elect.	3
AGRO 2231, Intro. Urban Soils	2		16
	17		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
R&WM 3301, Range Plants	3	ENGL, 3365, Prof. Rpt. Writing	3
R&WM 3101, Range Plant Ident.	1	Oral Comm. elect.	3
PALA 2402, L.A. Design II	4	POLS 3340, Fiscal Admin.	3
ENTO 2301, Intro. Ento.	3	PALA 4303, Land. Res. Prot. Strat.	3
MCAG 2302, Ag. Surv. & Land. Con.	3	Elective	4
P R 3310, Prin. Pub. Rel.	3		16
	17		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
PALA 4302, Land & Water Res.	3	PALA 3304, L.A. Design Impl. I	3
PALA 4305, Rev. Prod. Act.	3	PALA 4403, Aerial Phot.	4
PALA 4100, Seminar	1	POLS 3342, Personnel Admin.	3
Elective	3	PALA 4202, Park Admin.	2
Directed elective	6	Elective	3
	16		15

Hours required for graduation, exclusive of P.E., Band, ROTC, or Nutrition—128.

Landscape Architecture Curriculum.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	*PALA 3306, Graphics I	3
MATH 1320, Coll. Algebra	3	ENGL 1302, Adv. Coll. Rhetoric	3
*PALA 1302, Intro. to Land. Arch.	3	MATH 1321, Trig.	3
*HORT 1311, Prin. Hort.	3	GEOL 1303, Phys. Geol.	3
HIST 2300, Hist. of U.S. to 1877	3	GEOL 1101, Phys. Geol. Lab.	1
P.E., Band, ROTC, or Nutr.	1	HIST 2301, Hist. of U.S. since 1877	3
	16	P.E., Band, ROTC, or Nutr.	1
			17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
*PALA 3307, Graphic Comm. II	3	*PALA 2401, Land. Arch. I	4
*R&WM 2302, Ecol. & Conservation	3	*PALA 3304, L.A. Design Impl. I	3
*PALA 3302, Develop. of L.A.	3	*PALA, 4306, Graphics III	3
*PHYS 1306, General Physics	3	*AGSC 2300, Computers in Ag.	3
*PHYS 1103, Exp. Gen. Physics	1	*HORT 4313, Arboriculture	3
*CTEC 2301 Surv. & Surveys or			16
*MCAG 2302, Ag. Surv. & Conserv.	3		
	16		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
*PALA 2402, Land. Arch. II	4	*PALA 3401, Land. Arch. III	4
*PALA 3404, L.A. Design Imp. II	4	COMS 3308, Bus. & Prof. Speech	3
*AGRO 2231, Urban Soils	2	*PALA 4404, L.A. Design Impl. III	4
ENGL 2309, Patt. of Rpts.	3	*PALA 4304, Watershed Mgt.	3
*HORT, 2313, Herb. Plant Mtls.	3	*HORT 2314, Woody Plant Mtls.	3
	<u>16</u>	**PALA 4000, Internship	
			<u>17</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
*PALA 3402, Land. Arch. IV	4	*PALA 4401, Land. Arch. V	4
*PALA 4302, Land & Water Res.	3	AECO 2305, Fund. of Ag. Eco. or	
*PALA 3403, Plant. Design	4	ECO 2305	3
Social Science elective	3	POLS 1301, Am. Govt. Funct.	3
*PALA 4308, Comp.-Aided Des. in L.A.	3	*PALA 4309, Adv. Comp.-Aided	
	<u>17</u>	Design in L.A. or directed elect.	3
		Directed elective.	3
		**PALA 4000, Internship	
			<u>16</u>

FIFTH YEAR

<i>Fall</i>		<i>Spring</i>	
*PALA 4402, Land. Arch. VI	4	*PALA 4405, Land. Arch. VII	4
*PALA 4311, Prof. Practice	3	*PALA 4403, Aerial Photo. Interp.	4
POLS 2302, Am. Publ. Policy	3	*PALA 4100, Seminar	1
Directed elective	3	*PALA 4303, Land Res. Prot. Strat.	3
	<u>13</u>	Directed Elective	3
			<u>15</u>

*Must be passed with a minimum grade of C for acceptance as a prerequisite course and for graduation and must not be taken pass-fail.

**Strongly recommended. To be arranged in spring, executed in summer, graded in fall.

Directed electives are subject to approval of the academic advisor and department chairperson. Hours required for graduation, exclusive of P.E., Band, ROTC, or Nutrition—157.

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. F, S.
1302. **Introduction to Landscape Architecture (3:3:0).** An introduction to the profession of landscape architecture which covers its scope, historical perspectives, and some of its contemporary practitioners and their contributions. F.
2301. **Basic Natural and Cultural Resource Interpretation (3:3:0).** Basic interpretation competency for park and natural resource interpreters and communicators. F, even years.
2401. **Landscape Architecture I (4:1:6).** Prerequisite: PALA 1302 and 3302 or consent of instructor. A basic course in landscape architecture incorporating the elements and principles of design in three dimensions. Project management skills. S.
2402. **Landscape Architecture II (4:1:6).** Prerequisite: PALA 2401. A continuation of PALA 2401 with additional emphasis on site inventory, analysis, programming, and their relationship to the design process. Collaboration. F.

- 3301. Basic Park Administration (3:3:0).** A study of administration, operation, management, and history of city, county, state, and national parks. F.
- 3302. Development of Landscape Architecture (3:3:0).** History of landscape architecture. Design as expression of culture and societies' relationships to nature. Geographical, historical, and cultural context of major movements in landscape architecture. S.
- 3304. Landscape Architecture Design Implementation I (3:2:4).** Prerequisite: CTEC 2301 or MCAG 2302. Introduction to landscape architecture implementation with emphasis on basic principles of site layout, grading and drainage, earthwork computations, and the implementation drawing techniques. S.
- 3306. Graphic Communication I (3:1:4).** Skills and techniques of freehand drawing. Various media and subjects. Develops understanding of relative, one-point, two-point perspective; shading, shadow, form, line, texture; elements of composition. F, S.
- 3307. Graphic Communication II (3:1:4).** Prerequisite: PALA 3306. Continuation of PALA 3306. Emphasis on three-dimensional representation and color work. Develops knowledge of skills for effective graphic expression of design thought. F, S.
- 3401. Landscape Architecture III (4:1:6).** Prerequisite: PALA 2402 and admission to the professional program. Site planning and design as they apply to projects of various scale, scope, and resolution. S.
- 3402. Landscape Architecture IV (4:1:6).** Prerequisite: PALA 3401, 4304, 4306, and 4404. Regional landscape planning based on natural and cultural resource factors. F.
- 3403. Planting Design (4:1:6).** Prerequisite: HORT 2313, 2314, 4313. R&WM 2302, PALA 3401. Selection and arrangement of plant materials for landscape architectural developments for aesthetic and other functional purposes. Implementation drawings. F.
- 3404. Landscape Architecture Design Implementation II (4:2:4).** Prerequisite: PALA 3304, PHYS 1306 and 1103. Introduction of landscape architecture construction systems, materials, structures, joining of materials, and implementation drawings. F.
- 4000. Internship (V1-6).** Minimum 8 weeks and prior departmental approval. Credit or no credit.
- 4100. Seminar (1:1:0).** Prerequisite: Senior standing. Assigned readings, informal discussions, and oral reports and papers. F.
- 4201. Park Administration and Landscape Architecture Problems (2).** An investigation of a problem in the profession of special interest to the student. Open to advanced students. F, S, SS.
- 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. S, even years.
- 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. F, S, SS.
- 4302. Land and Water Resources for Regional Landscape Planning and Management (3:3:0).** Prerequisite: Senior standing or consent of instructor. Concepts of environmental planning for preservation, conservation, and development of land and water resources within regional landscapes. Emphasis on procedures, concepts, and policies with focus on urban environments and park, recreation, and open space situations.
- 4303. Land Resource Protection Strategies (3:3:0).** Principles and concepts of public and private land regulatory and protection strategies with emphasis on landscape management. Focus is on operations and procedures encountered in working

with land use controls and land development regulatory programs of local and state governments. Course directed toward practice skills needed by landscape architects and park administrators.

4304. **Watershed Management (3:3:0).** Prerequisite: Consent 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.
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. F.
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.
4308. **Computer-Aided Design in Landscape Architecture (3:1:4).** Prerequisite: PALA 4306 and AGSC 2300. Hands-on introduction to current computer-aided design technology that is currently most applicable to the needs of the profession of landscape architecture. F.
4309. **Advanced Computer-Aided Design in Landscape Architecture (3:1:4).** Prerequisite: PALA 4308 and fourth-year standing in landscape architecture. Exploration of contemporary applications of CAD in the profession of landscape architecture. S.
4310. **Shaping the American Landscape (3:3:0).** Prerequisite: PALA 3302. Analysis of factors which shaped the American landscape including the growth and status of the profession with emphasis on selected landscape architecture.
4311. **Professional Practice (3:3:0).** Prerequisite: Fifth-year standing. Methods, procedures, and ethics of professional practice of landscape architecture. S.
4401. **Landscape Architecture V (4:1:6).** Prerequisite: PALA 3402 and 3403. Landscape architecture planning and design in the urban setting. S.
4402. **Landscape Architecture VI (4:1:6).** Prerequisite: PALA 4401 and 4308. Landscape architectural projects of an advanced and complex nature. F.
4403. **Aerial Photo Interpretation in Natural Resource Management (4:2:4).** Fundamentals of aerial photograph reading, interpretation, and evaluation. Introduction to remote sensing techniques and geographic information systems. F, S.
4404. **Landscape Architecture Design Implementation III (4:2:4).** Prerequisite: PALA 3404 and AGRO 2231. Complex grading and drainage, drainage structures, retaining walls, horizontal and vertical circulation alignment in large scale site development. Introduction to irrigation and lighting design. S.
4405. **Landscape Architecture VII (4:1:6).** Prerequisite: PALA 4402 and faculty approval of project. Supervised individual design demonstration project representing comprehensive synthesis of learned knowledge and skills evolving from the study of landscape architecture. S.
4406. **Collaboration Studio (4:1:6).** An interdisciplinary studio for the design professions which addresses the process and skills necessary for collaboration as well as team-developed products.

Department of Range and Wildlife Management

Horn Professor Henry Wright, Chairperson.

Professors Britton, Bryant, Dahl, Parker, and Sosebee; Associate Professors Hunter and Smith; Assistant Professors Demarais, Lutz, Mathew, Patino, Schramm, and Wester; Adjunct Professors Drawe, Guthery, Jacoby, and Pence.

This department supervises the following degree programs: *Bachelor of Science* in RANGE MANAGEMENT, *Bachelor of Science* in WILDLIFE MANAGEMENT, *Master of Science* in RANGE SCIENCE, *Master of Science* in WILDLIFE SCIENCE, and *Doctor of Philosophy* in AGRICULTURE with options in Range 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 management specialization prepares students for graduate school and meet the Civil Service requirements for positions as range conservationists for agencies such as the Soil Conservation Service, Forest Service, and Bureau of Land Management. Specializations in ranch management and range business are options for students who plan to go back to a ranch or plan to enter agribusiness. These specializations do not prepare students for jobs with federal agencies.

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 requirement for freshmen and sophomores in the department is the same as that for the University. A 2.5 GPA is required to register for the junior and senior years. 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.

Students are encouraged to become actively involved in the clubs sponsored by the Range and Wildlife Management Department—the Range and Wildlife Club and the Soil Conservation Club. These clubs promote involvement in professional societies such as the Wildlife Society, the Society for Range Management, and the Soil Conservation Society of America. Club activities also include regularly scheduled meetings with guest speakers and social events such as barbecues.

Range Management Curriculum, Range Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
BIOL 1401, Biol. of Plants	4	BIOL 1402, Biol. of Animals	4
R&WM 2301, Intro. Wildlife.	3	MATH 1331, Intro. Math. Anal. or	
R&WM 4100, Seminar	1	MATH 1351	3
MATH 1330, Intro. Math. Anal. or		CHEM 1307, Prin. Chem. I	3
MATH 1350	3	CHEM 1101, Exp. Gen. Chem. I (Lab.)	1
P.E., Band, ROTC, or Nutr.	1	R&WM 2302, Ecol. & Cons. Nat. Res.	3
	15	R&WM 4100, Seminar	1
			18

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
AGSC 2300, Computers in Ag.	3	*BOT 3304, Tax. Flowering Plants	3
R&WM 3301, Range Plants	3	AGRO 2432, Prin. & Pract. Soils	4
R&WM 3101, Range Plant Ident.	1	BOT 3401, Plant Physiol.	4
CHEM 1308, Prin. Chem. II	3	POLS 2302, Am. Pub. Pol.	3
CHEM 1102, Exp. Gen. Chem. (Lab.)	1	AECO 2305, Fund. Ag. Eco.	3
POLS 1301, Am. Govt., Org.	3	P.E., Band, ROTC, or Nutr.	1
COMS 2300, Public Speaking	3		18
	17		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
*R&WM 3302, Range Plant Ecol.	3	*R&WM 3304, Prin. Range Mgt.	3
*R&WM 3201, Veg. Invent. & Anal.	2	*ANSC 3301, Prin. Nutri.	3
*CHEM 3303, Intro. Org. Chem.	3	AECO 3401, Ag. Stat.	4
CHEM 3103, Intro. Org. Chem. Lab.	1	R&WM 4100, Seminar	1
HIST 2300, Hist. of U.S. to 1877	3	AGRO 3421, Fund. Prin. Gen. or	
*AGRO 4332, Soil Class.	3	BIOL 3301, Gen.	3-4
Humanities or fine arts elect.	3	Elective	3
	18		17-18

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
*R&WM 4302, Range Impr.	3	*R&WM 4303, Range. Anal. & Plan.	3
*R&WM 4304, Fire Ecol. & Mgt.	3	*AECO 3302, Agricultural Finance	3
*AGRO 3321, For. & Past. Crops	3	†HIST 2301, Hist. U.S. since 1877	3
PALA 4304, Watershed Mgt. or		ENGL 3365, Tech. Writing	3
AGEN 4401	3-4	Humanities or fine arts elective	3
ANSC 4306, 4308, or 3302	3		15
	15-16		

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

*Offered only during semester designated, except summer terms.

†Wildlife majors should register for the section designated for wildlife majors.

Range Management Curriculum, Ranch Management Specialization

FIRST YEAR			
<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
BIOL 1401, Biol. of Plants	4	BIOL 1402, Biol. of Animals	4
CHEM 1305, Ess. Chem. I	3	MATH 1331, Intro. Math. Anal.	3
CHEM 1101, Exp. Gen. Chem. I (Lab.)	1	ANSC 1301, Gen. Anim. Sci.	3
MATH 1330, Intro. Math. Anal.	3	R&WM 2302, Ecol. & Cons. Nat. Res.	3
R&WM 2301, Intro. Wildlife	3	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	1		17
	18		
SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
ANSC 3305, Appl. An. Nut.	3	AECO 3302, Ag. Finance	3
R&WM 3301, Range Plants	3	AGRO 2432, Prin. & Pract. Soils	4
R&WM 3101, Range Plant Ident.	1	POLS 2302, Am. Pub. Pol.	3
AECO 2305, Fund. Ag. Eco	3	AGSC 2300, Computers in Ag.	3
POLS 1301, Am. Govt., Org.	3	COMS 2300, Public Speaking	3
Elective	3		16
	16		
THIRD YEAR			
<i>Fall</i>		<i>Spring</i>	
ACCT 2300, Acct. I	3	AECO 3304, Farm & Ranch Mgt.	3
*R&WM 3302, Range Plant Ecol.	3	ACCT 2301, Acct. II	3
*R&WM 3201, Veg. Invent. & Anal.	2	*R&WM 3304, Prin. Range Mgt.	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
†Elective	3	R&WM 4100, Seminar	1
Humanities or fine arts	3	ENGL 3365, Tech. Writing or ENGL 2309,	3
	17	Reports & Corr.	3
			16
FOURTH YEAR			
<i>Fall</i>		<i>Spring</i>	
R&WM 4309, Wildlife Habitat	3	*R&WM 4303, Range. Anal. & Plan.	3
R&WM 4306, Upland Game or		AECO 3401, Ag. Statistics	4
*R&WM 4305, Big Game Ecology	3	†Elective	3
*R&WM 4302, Range Impr.	3	Elective	3
Humanities or fine arts	3	ANSC 3306, An. San. & Dis. Control	3
†Elective	6		16
	18		

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

*Offered only during semester designated, except summer terms.

†Electives must be chosen as follows: 3 hours from Agricultural Economics, 6 hours from Animal Science (3000 or 4000 level), 3 hours from Business Administration.

Range Management Curriculum, Range Business Specialization.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
BIOL 1401, Biol. of Plants	4	BIOL 1402, Biol. of Animals	4
R&WM 4100, Seminar	1	CHEM 1305, Ess. Chem. I	3
†MATH 1330, or 1350, or 1380	3	CHEM 1101, Exp. Gen. Chem. I (Lab.)	1
R&WM 2301, Intro. Wildlife	3	MATH 1331 or MATH 1351	3
P.E., Band, ROTC, or Nutr.	1	R&WM 2302, Ecol. & Cons. Nat. Res.	3
	<u>15</u>	P.E., Band, ROTC, or Nutr.	1
		R&WM 4100, Seminar	<u>1</u>
			19

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
R&WM 3301, Range Plants	3	AGRO 2432, Prin. & Pract. Soils	4
R&WM 3101, Range Plant Ident.	1	AECO 2306, Prin. Mkt. Ag. Prod.	3
AECO 2305, Fund. Ag. Eco. or		POLS 2302, Am. Pub. Pol.	3
ECO 2305, Prin. Eco.	3	ACCT 2301, Elem. Acct. II	3
CHEM 3303, Intro. Org. Chem.	3	AGSC 2300, Computers in Ag.	3
CHEM 3103, Intro. Org. Chem. Lab.	1	Humanities or fine arts	<u>3</u>
POLS 1301, Am. Govt., Org.	3		19
ACCT 2300, Elem. Acct. I	<u>3</u>		
	17		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
*R&WM 3302, Range Plant Ecol.	3	*R&WM 3304, Prin. Range Mgt.	3
*R&WM 3201, Veg. Invent. & Anal.	2	AECO 3302, Ag. Fin. or FIN 3320,	
BOT 3401, Plant Physiology	4	Corp. Fin. I	3
HIST 1301, Hist. of U.S. to 1877	3	ANSC 3301, Prin. Anim. Nutr.	3
*AGRO 4332, Soil Classif.	3	AECO 3401, Ag. Stat.	4
ANSC 3302, 4306, or 4308	<u>3</u>	Humanities or fine arts	<u>3</u>
	18		16

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
*R&WM 4302, Range Improv.	3	*R&WM 4303, Range. Anal. & Plan.	3
*R&WM 4304, Fire Ecol. & Mgt.	3	ENGL 3365, Tech. Writing	3
*AGRO 3321, For. & Past. Crops	3	ACCT 3307, Income Tax Acct.	3
FIN 3323, Prin. Money, Bank, & Credit		COMS 3308, Bus. & Prof. Speech	3
or AECO 3315, Ag. Price Theory	3	BLAW 3391, Business Law I	3
MGT 3370, Organ. & Mgt.	3	AECO 4303, Farm & Ranch Appraisal	<u>3</u>
HIST 2301, Hist. U.S. from 1877	<u>3</u>		18
	18		

Hours required for graduation, exclusive of P.E., Band, ROTC, or Nutrition—140.

*Offered only during semester designated, except summer terms.

†Students taking MATH 1330 must follow with MATH 1331 or MATH 1351.

Wildlife Management Curriculum.

FIRST YEAR			
<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
BIOL 1401, Biol. of Plants	4	BIOL 1402, Biol. of Animals	4
CHEM 1307, Prin. Chem. I	3	CHEM 1308, Prin. Chem. II	3
CHEM 1103, Prin. Gen. Chem. I (lab.)	1	CHEM 1104, Prin. Gen. Chem. II (lab.)	1
MATH 1330, Intro. Math. Anal. or		MATH 1331, Intro. Math. Anal. or	
MATH 1350, Anal. Geo.	3	MATH 1351, Calculus	3
P.E., Band, ROTC, or Nutr.	1	R&WM 2302, Ecol. & Cons. Nat. Res.	3
R&WM 4100, Seminar	1	R&WM 4100, Seminar	1
	16		18
SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
R&WM 2301, Intro. Wildlife	3	AGSC 2300, Computer in Ag.	3
R&WM 2303, Intro. Fisheries	3	CHEM 3303, Intro. Org. Chem.	3
R&WM 3301, Range Plants	3	CHEM 3103, Intro. Org. Chem. Lab.	1
R&WM 3101, Range Plant Ident.	1	AGRO 3421, Fund. Prin. Gen. or	
*ZOOL 2406, Comp. Anat. Game Ani.	4	BIOL 3301, Genetics	3
POLS 1301, Am. Govt., Org.	3	POLS 2302, Am. Pub. Pol.	3
P.E., Band, ROTC, or Nutr.	1	AECO 2305, Fund. Ag. Eco.	3
	18		16-17
THIRD YEAR			
<i>Fall</i>		<i>Spring</i>	
*R&WM 3302, Range Plant Ecol.	3	AECO 3401, Ag. Stat.	4
*BOT 3401, Plant Physiology	4	*R&WM 3304, Prin. Range Mgt.	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
*ZOOL 4306, Intro. Mammalogy	3	Humanities or Fine Arts	3
ZOOL 4308, Ornithology	3	AGRO 2432, Prin. & Pract. of Soils	4
	16		17
FOURTH YEAR			
<i>Fall</i>		<i>Spring</i>	
*R&WM 4307, Wild. Inv. Tech.	3	COMS 2300, Public Speaking	3
*R&WM 4309, Wild. Habitat Mgt.	3	R&WM 4303 or PALA 4302 or	
AECO 4302, Stat. Methods in Ag.	3	4303 or 4304	3
Humanities or fine arts elective	3	*R&WM 4308, Wild. Pop. Dyn.	3
Electives	6	ENGL 3365, Tech. Writing	3
	18	Elective	3
			15

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

*Offered only during semester designated, except summer terms.

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 and nonrenewable 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. F.
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. F.
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, plant communities, 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. F.
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. S.
4000. **Internship (V1-12).**
4100. **Seminar (1:1:0).** An organized discussion of current problems and research in range and wildlife 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. F.
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. S.
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. F.
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. F, odd years.

- 4306. Upland Game Ecology (3:2:3).** Prerequisite: R&WM 2301 and ZOOL 4308, 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. S, odd years.
- 4307. Wildlife Investigational Techniques (3:3:3).** Prerequisite: Junior standing in biological sciences and AECO 3401. 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. F.
- 4308. Wildlife Population Dynamics and Analysis (3:3:0).** Prerequisite: AECO 3401, 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. S.
- 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. F.
- 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. F, even years.
- 4401. Fisheries Management (4:3:3).** Prerequisite: AECO 3401. 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. S, even years.



College of Architecture

Horn Professor Willard B. Robinson, *Interim Dean*

Professors Koh, Peng, A.D. Thompson, J.E. White and J.P. White; Associate Professors Coombs, Davis, Felty, M. Johnson, Lehmann, Mross, Perl, Peters, Spitzglas, Steele, and V. Thompson. Assistant Professors Aranha, Bayegan, Driskill, Dymond, Hill, Nowak, and Watkins; Lecturers Cantrell, Daughtry, Loudon, Martin, McCutchan, Powell, and Shacklette.

The college supervises the following degree programs: ARCHITECTURE, *Bachelor of Architecture* and *Master of Architecture*; LAND-USE PLANNING, MANAGEMENT, AND DESIGN, *Doctor of Philosophy*.

The Bachelor of Architecture degree is accredited by the National Architectural Accrediting Board. Students may specialize in architectural design, architectural structures, architectural history, and historic preservation or urban design. Students choosing either of the latter two specializations will take special course work which will be substituted for the elective requirements listed in the Architecture Core Curriculum, Design Specialization. Elective hours may be used to study a broad spectrum of interdisciplinary offerings or they may be concentrated into one of many minor studies.

Students selecting the structures specialization should do so upon their initial enrollment. A student may elect the design specialization anytime prior to completing the first three years of the core curriculum. A dual degree (a degree in Architecture and a degree in Civil Engineering) is offered with the Department of Civil Engineering. Undergraduate degree requirements are given in the accompanying tables.

The College of Architecture is affiliated with the American Institute of Architects, Association of Collegiate Schools of Architecture, the National Architectural Accrediting Board, the National Council of Architectural Registration Boards, the Architectural Research Centers Consortium, the Center for the Study of American Architecture, Intern Development Program, the American Institute of Architecture Students, and Tau Sigma Delta (national honor society in architecture and allied arts).

Two research institutes provide faculty and students with additional opportunities for study and research. The Institute for Urban Studies International (IUSI) is an exchange program with foreign universities and nations. The applied Planning Research Institute for Municipalities, Environments, and Regions (aPRIMER) is a consulting-advising association comprised of professional associates from all regions of the United States.

The educational mission of the College of Architecture is to educate students for leadership roles in architecture and to encourage students to explore enriching areas of knowledge to increase the potential for leading creative and meaningful lives.

General Education Requirements. The University has established general education requirements for all students. These requirements will ensure breadth in each academic program. Students should consult their academic dean regarding specific general education course requirements. Students are urged to seek advisement prior to their first enrollment to avoid losing credit. Students may also find a listing of General Education Requirements in the *Directory of Classes*.

Entry Requirements. In addition to general University requirements, the following high school subjects and credits are required for unconditional admission in the Architecture program.

Mathematics: Algebra I, II, Geometry (1 unit each),

Trigonometry (1/2 unit)

English: English I, II, III, IV (1 unit each)

Science: Physics or Chemistry I (1 unit)

Academic reviews required for admission to the professional program include high school GPA, rank in class, SAT and ACT scores, and specific college preparation course work. Minimum SAT and ACT score for 1991 will be SAT 1000, ACT 24.

In addition to the above, studies in world history, geography, foreign language, and art are strongly recommended. See admission requirements for Texas Tech University.

Entering freshmen who do not meet the unconditional entry requirements may enter the College of Architecture as conditional students. All conditional deficiencies must be removed and certified by the College of Architecture advisor before a student may enroll in architectural design studio courses. Conditional students must maintain at least a 2.25 cumulative GPA.

Students who successfully complete their freshman year (24 hrs. min.) and meet all requirements stated above may complete their initial design course work in a special summer program prior to their second year of study.

Transfer Students. 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 at least a 2.50 GPA, not less than a 2.50 average in architecture or architecturally related courses, and not less than a 2.50 average for the last semester attended prior to transfer. Admission by transfer to the upper level will be governed by all requirements listed for architecture majors.

Architecture Majors. Majors in architecture may not register for work in the advanced undergraduate program which starts with the junior year until certified eligible by the College of Architecture. To qualify for certification a student must have completed the program for the first two years with a minimum 2.25 GPA and must maintain that average in architectural course work. A minimum 2.00 grade must be earned in each design course to progress to the next design studio. This minimum 2.00 standard also applies to the final thesis programming and thesis design studio course work. The academic information section of this catalog gives specific information regarding academic status. Students on scholastic probation or scholastic suspension should familiarize themselves with those regulations.

Nonmajors. Many courses in architecture—especially those in city planning, history of architecture, and architectural communications—are available as electives to students majoring in other disciplines. 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 Dean.

Student Projects. The College of Architecture reserves the right to retain, exhibit, and reproduce work submitted by students. Work submitted for grade is the property of the college and remains such until it is returned to the student.

Pass-Fail Grading. Only general elective courses may be taken for pass-fail grading. Architecture majors may take no more than 9 hours pass-fail to satisfy degree requirements.

Electives. Students may select electives to broaden their educational experiences or they may elect to receive a minor (18 hours) in one of many study areas. Students in the fourth and fifth years of study may not take a freshman-level elective course without approval from the college advisor.

Internship Program. Subsequent to completion of the third-year program, each student is expected to participate for one semester in the professional internship program. The program provides opportunities for professional experience in some of the nation's leading architectural firms.

Advising. Each student will be appointed a faculty advisor upon entering the College of Architecture and for each year of study.

Application for Degree. A student must file an "Application for Degree" with the office of the Dean of the College of Architecture 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 Architecture. See also "Uniform Degree Requirements of the University" in this catalog.

Catalog Selection. Students will use the catalog issued for the year in which they were first officially admitted to the College of Architecture or a more recent catalog if approved. However, if they later transfer to another institution or another college at Texas Tech, they will use the catalog in effect when they are readmitted to the College of Architecture. For these purposes, a catalog expires after seven years.

Correspondence Courses. Major or minor courses may not be taken by correspondence. A correspondence course cannot be used for graduation when completed during the student's final semester or summer term.

Course Load. The normal course load for a semester is 16 to 18 hours. The dean's approval is required for a course load of more than 18 semester hours (7 hours for a summer term). Correspondence courses are included in the student's course load, as are courses taken concurrently at other institutions.

Students who are employed for more than 20 hours each week must have approval of the College of Architecture to register for more than 13 hours per semester.

Ineligible Registration. The College of Architecture reserves the right to 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.

Repeated Courses. Repeating a course does not remove a prior grade.

Summer Work. All course work to be taken at any other institution must receive prior approval from an undergraduate counselor.

Architecture Core Curriculum, Design Specialization.

Introductory Program. Academic reviews required for admission to the professional program include high school GPA, rank in class, SAT and ACT scores, specific college preparation course work and two years of foreign language (1991).

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 1401, Arch. Design I	4	ARCH 1402, Arch. Design II	4
ARCH 1211, Intro. to Arch.	2	ARCH 1212, Arch. Aesthetics	2
ARCH 1341, Arch. Comm. I	3	ARCH 1342, Arch. Comm. II	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Public Pol.	3
MATH 1330 or 1350	3	MATH 1331 or 1351	3
	<u>18</u>		<u>18</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 2401, Arch. Design III	4	ARCH 2402, Arch. Design IV	4
ARCH 2311, Hist. Ancient & Medieval	3	ARCH 2312, Hist. Renais. & Baroque	3
ARCH 2341, Arch. Comm. III	3	ARCH 2353, Computers in Arch.	3
ARCH 2351, Building Systems I	3	ARCH 2352, Building Systems II	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
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>18</u>		<u>18</u>

Intermediate program. Academic reviews, required for admission to the intermediate program include academic course work, design portfolio, GPA, and TASP.

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 3501, Arch. Design V	5	ARCH 3502, Arch. Design VI	5
ARCH 3311, Hist. 19th & 20th Cent.	3	ARCH 3312, Contemp. Arch. Issues	3
ARCH 3353, Arch. Envr. Systems I	3	ARCH 3354, Arch. Envr. Systems II	3
C E 3380, Struc. Mech. I	3	C E 3381, Struc. Mech. II	3
Elective	3	Elective	3
	<u>17</u>		<u>17</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 4501, Arch. Design VII	5	ARCH 4502, Arch. Design VIII	5
ARCH 4381, Urban Design & Plan.	3	ARCH 4353, Adv. Computer Appl.	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
C E 4385, Structures (III)	3	COMS 3308, Bus. & Prof. Comm.	3
Elective	3	Elective	3
	<u>17</u>		<u>17</u>

Advanced Program. Academic reviews required for admission to advanced program include course work, design portfolio, GPA, and internship.

FIFTH YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 4591, Arch. Design IX	5	ARCH 4692, Arch. Design X, Thesis	6
ARCH 4391, Arch. Prof. Practice	3	ARCH 4392, Arch. Prof. Practice Sem.	3
Arch. elec. or wkshop. or sem.	3	Arch. elec. or wkshop. or sem.	3
ARCH 4395, Thesis Res. & Prog.	3	Elective	3
Elective	3		<u>15</u>
	<u>17</u>		

Minimum hours required for graduation—172.

Specializations.

Architectural History and Historic Preservation Specialization (24 hrs.)—172 total These courses are required to be substituted for electives listed in the core curriculum.

ARCH 3313, Contemp. Res. Arch.	4th year
ARCH 3314, History Texas Arch.	3rd year
ARCH 3334, Arch. Conservation	3rd year
ARCH 4311, Arch. /Art Arid Lands	5th year
ARCH 4312, Pre-Columbian Arch.	4th year
ARCH 4313, Post-Columbian Arch.	5th year
ARCH 4314, Oriental Arch.	5th year
ARCH 4315, Early American Arch.	5th year

Urban Design Specialization (24 hrs.)—175 total These courses are required to be substituted for electives listed in the core curriculum.

ARCH 3381, Community Develop.	3rd year
ARCH 3383, Urban Desn. Theory	3rd year
ARCH 4382 or 4481	3rdsummer
SOC 4362, Cities & City Life	4th year
PHIL 3331, Phil. Social /Human Sc.	4th year
FIN 4336, Urban Land Develop.	5th year
*POLS 3324, Urban Politics	5th year
ECO 3302, Eco. of Urban Places	5th year
or *POLS 3346, Pub.Policy Analysis	5th year

*Advanced political science courses may be substituted for POLS 2302 with college approval.

Architecture Curriculum, Structures Specialization.

Introductory program. Academic reviews required for admission to the professional program include high school GPA, rank in class, SAT and ACT scores, specific college preparation course work, and two years of foreign language (1991).

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 1401, Arch. Design I	4	ARCH 1402, Arch. Design II	4
ARCH 1211, Intro. to Arch.	2	ARCH 1212, Arch. Aesthetics	2
ARCH 1341, Arch. Comm. I	3	ARCH 1342, Arch. Comm. II	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Public Pol.	3
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	3
	<u>18</u>		<u>18</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 2401, Arch. Design III	4	ARCH 2402, Arch. Design IV	4
ARCH 2311, Hist. Ancient & Medieval	3	ARCH 2312, Hist. Renais. & Baroque	3
ARCH 2341, Arch. Comm. III	3	C E 1305, Engineering Analysis	3
ARCH 2351, Building Systems I	3	C E 3201, Construction Materials	2
MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>17</u>		<u>16</u>

SUMMER

<i>First Term</i>		<i>Second Term</i>	
PHYS 1308, Prin. Phys. I	3	PHYS 2301, Prin. Phys. II	3
PHYS 1105, Prin. Phys. Lab.	1	PHYS 1106, Prin. Phys. Lab.	1
CE 2301, Statics	3	C E 3303, Mech. of Solids	3
	<u>7</u>		<u>7</u>

Intermediate Program. Academic reviews required for admission to intermediate program include academic course work, GPA, design portfolio, and TASP.

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 3501, Arch. Design V	5	ARCH 3502, Arch. Design VI	5
ARCH 3311, Hist. 19th & 20th Cent.	3	ARCH 3312, Contemp. Arch. Issues	3
ARCH 3353, Arch. Envr. Systems I	3	ARCH 3354, Arch. Envr. Systems II	3
CE 3306, Stress Analysis	3	C E 3321, Intro. Geotech Engr.	3
CE 2210, Proc. Prob. Analysis I	2	C E 3121, Geotech Engr. Lab.	1
	<u>16</u>	*COMS 3308, Bus. & Prof. Comm.	3
			<u>18</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 4501, Arch. Design VII	5	ARCH 4502, Arch. Design VIII	5
ARCH 4381, Urban Design & Plan.	3	ARCH 4353, Adv. Computer Appl.	3
HIST 2300, Hist. U.S. to 1877	3	HIST 2301, Hist. U.S. since 1877	3
C E 3440, Struc. Analysis I	4	C E 4340, Struc. Analysis II	3
	<u>15</u>	C E 3341, Prin. Struct. Design	<u>3</u>
			17

Advanced Program. Academic reviews required for admission to advanced program include academic course work, design portfolio, and internship.

FIFTH YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 4591, Arch. Design IX	5	ARCH 4692, Arch. Design X, Thesis	6
ARCH 4391, Arch. Prof. Practice	3	ARCH 4392, Arch. Prof. Practice Sem.	3
ARCH 4395, Thesis Res. & Prog.	3	C E 4330, Design Engr. Systems	<u>3</u>
C E 4343, Design Concrete Strc.	3		12
C E 4342, Design Steel Strc.	<u>3</u>		
	17		

Minimum hours required for graduation—178.

Dual-Degree Curriculum, Bachelor of Architecture (Structures Specialization) and Bachelor of Science in Civil Engineering.

Introductory Program. Academic reviews required for admission to the professional program include high school GPA, rank in class, SAT and ACT scores, specific college preparation course work and two years of foreign language (1991).

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 1401, Arch. Design I	4	ARCH 1402, Arch. Design II	4
ARCH 1211, Intro. to Arch.	2	ARCH 1212, Arch. Aesthetics	2
ARCH 1341, Arch. Comm. I	3	ARCH 1342, Arch. Comm. II	3
MATH 1351, Calculus I	3	MATH 1352, Calculus II	3
ENGL 1301, Ess. Coll. Rhetoric	3	C E 1305, Engineering Analysis	3
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	<u>1</u>
	<u>16</u>		16

SUMMER SESSION I

<i>First Term</i>		<i>Second Term</i>	
MATH 2350, Calculus III	3	MATH 3350, Math. for Engineers	3
PHYS 1308, Prin. Phys. I	3	PHYS 2301, Prin. Phys. II	3
PHYS 1105, Prin. Phys. I Lab.	<u>1</u>	PHYS 1106, Prin. Phys. II Lab.	<u>1</u>
	7		7

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 2401, Arch. Design III	4	ARCH 2402, Arch. Design IV	4
ARCH 2311, Hist. Ancient & Medieval	3	ARCH 2312, Hist. Renais. & Baroque	3
ARCH 2351, Bldg. Systems I	3	C E 3201, Construction Materials	2
C E 2210, Proc. Prob. Analysis I	2	C E 3210, Proc. Prob. Analysis II	2
C E 2301, Statics	3	C E 3303, Mech. of Solids	3
POLS 1301, Amer. Govt., Org.	<u>3</u>	POLS 2302, Amer. Public Pol.	<u>3</u>
	18		17

SUMMER SESSION II

<i>First Term</i>		<i>Second Term</i>	
CHEM 1307, Prin. of Chem. I	3	CHEM 1308, Prin. of Chem. II	3
CHEM 1103, Prin. of Chem. I (Lab.)	$\frac{1}{4}$	CHEM 1104, Prin. of Chem. II (Lab.)	$\frac{1}{4}$
	4		4

Intermediate Program. Academic reviews required for admission to the intermediate program include academic course work, design portfolio, GPA, and TASP.

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 3501, Arch. Design V	5	ARCH 3502, Arch. Design VI	5
ARCH 3311, Hist. 19th & 20th Cent.	3	ARCH 3312, Contemp. Arch. Issues	3
ARCH 3353, Arch. Envr. Systems I	3	C E 3305, Mech. of Fluids	3
C E 3302, Dynamics	3	C E 3321, Intro. to Geotech. Engr.	3
C TEC 2301, Surveying	$\frac{3}{17}$	C E 3121, Geotech. Engr. (Lab.)	$\frac{1}{4}$
			15

Academic reviews are required by the Department of Civil Engineering for admission to the fourth year. Each student must file an application for admission to the civil engineering degree program and submit a degree plan.

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 4501, Arch Design VII	5	ARCH 4502, Arch. Design VIII	5
ARCH 4381, Urban Design & Plan.	3	ARCH 4353, Adv. Computer Appl.	3
C E 3440, Struc. Analysis I	4	C E 3341, Prin. Struc. Design	3
*COMS 3308, Bus & Prof. Comm.	$\frac{3}{15}$	C E 4340, Struc. Analysis II	3
		ENGL 3365, Prof. Report Writing	$\frac{3}{17}$
			15

FIFTH YEAR

<i>Fall</i>		<i>Spring</i>	
C E 4342, Design Steel Struct.	3	C E 4343, Design Conc. Struct.	3
C E 3371, Envr. Engr. I	3	C E 4361, Transportation Engr.	3
C E 3171, Envr. Engr. I (Lab.)	1	C E 3372, Water Systems Design	3
M E 3321, Engr. Thermo. I	3	E E 2303, Elec. Systems Analysis	3
C E 3354, Engr. Hydrology	$\frac{3}{13}$	I E 3322, Engr. Eco. Analysis	$\frac{3}{15}$
			15

Advanced Program. Academic reviews required for admission to advanced program include course work, design portfolio, GPA, and internship.

SIXTH YEAR

<i>Fall</i>		<i>Spring</i>	
ARCH 4591, Arch. Design IX	5	ARCH 4692, Arch. Design X, Thesis	6
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
**ARCH 4391, Arch. Prof. Practice	3	C E 4330, Design Engr. Systems	$\frac{3}{12}$
ARCH 4395, Thesis Res. & Prog.	$\frac{3}{14}$		
			12

*Or approved Communication Studies substitution.

**May elect to substitute both C E 4292, Law & Ethics and C E 4293, Eng. Law Admission and progression requirements must meet exact requirements of both Architecture and Engineering.

Minimum hours required—207.

Courses in Architecture. (ARCH)

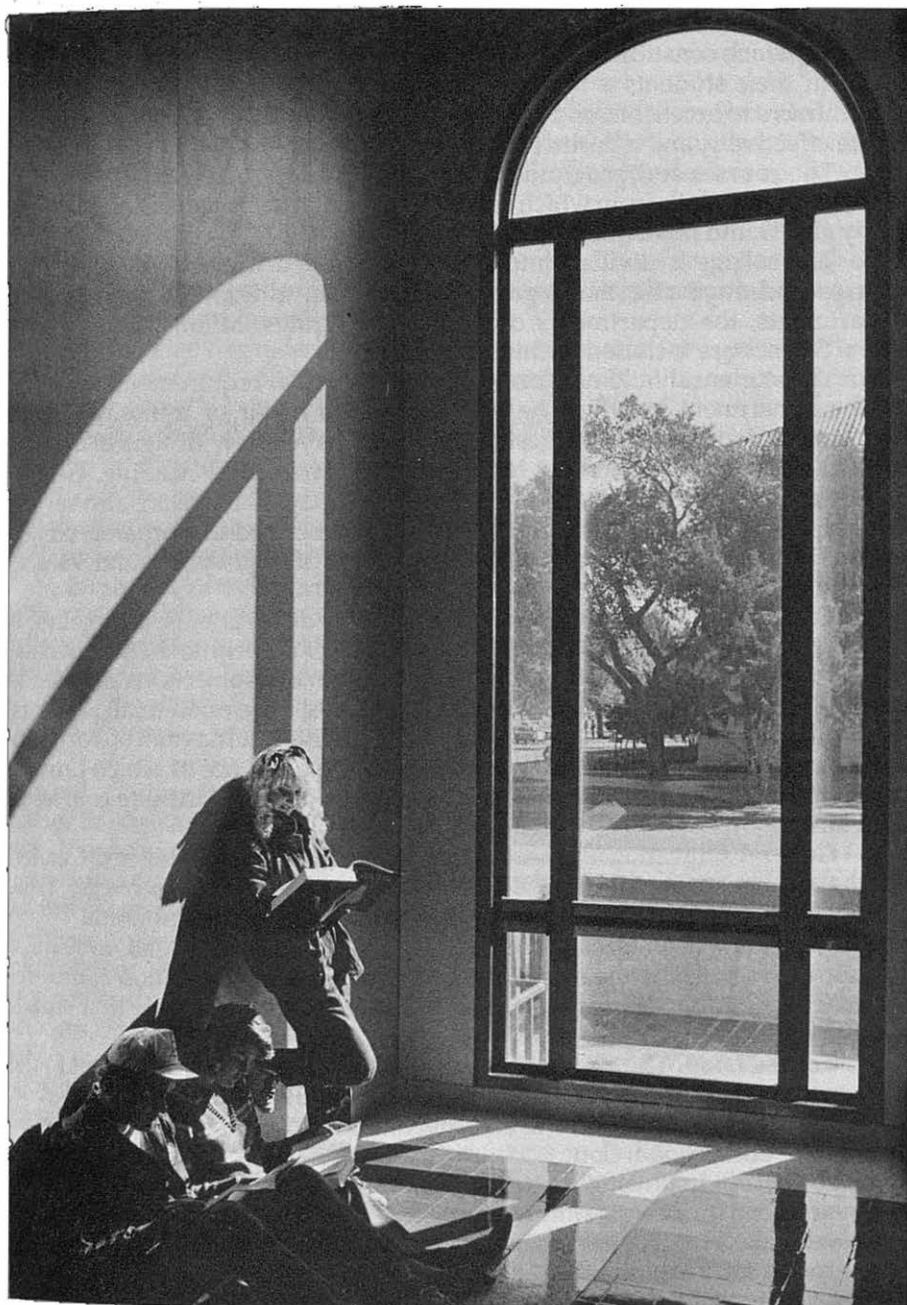
Courses designated with an asterisk (*) are open only to architecture majors or to students having permission of the dean.

- 1211. Introduction to Architecture (2:2:0).** An introduction to the architectural profession, its diverse elements and opportunities. University resources examined and curricular opportunities explored in relation to career alternatives.
- 1212. Architectural Aesthetics (2:2:0).** Architecture as a contemporary philosophical concept. Lectures in visual experiences to develop perceptive faculties in the aesthetics of architecture.
- 1341. Architectural Communication 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 Communication II (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.
- *1401. Architectural Design I (4:3:9).** Introduction to architecture theories, perceptions, environmental factors, structural concepts, and anthropometrics and architectural design principles and processes with emphasis on three-dimensional concepts. Development of graphic communication skills. Outside assignments required.
- *1402. Architectural Design II (4:3:9).** Prerequisite: ARCH 1401. Continuation of ARCH 1401. Outside assignments required.
- 2311. 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.
- 2312. History of Renaissance and Baroque Architecture (3:3:0).** Prerequisite: ARCH 2311. 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 Communication III (3:0:9).** Prerequisite: ARCH 1342. Color theory and its use in graphic expression. Mixed media. Sequence of presentation techniques. Two- and three-dimensional studies. Outside assignments required.
- 2351. Building Systems I (3:3:0).** Corequisite: ARCH 2401. Concepts and principles for the selection of appropriate structural, enclosure, mechanical, and interior systems. Systems performance is introduced in relation to spatial, visual, thermal, and acoustical performance and physiological, psychological, sociological, and economic design demands.
- 2352. Building Systems II (3:3:0).** Prerequisite: ARCH 2351. Corequisite: ARCH 2402. Analysis of components and assemblies, developing further the holistic view of building technologies around the concept of integrated building systems performance.
- *2353. Computers in Architecture (3:2:2).** An introduction to computers in architecture and applications in the operating environment, basic programming, computational applications, and computer-aided design. Outside assignments required.
- *2401. Architectural Design III (4:3:9).** Prerequisite: ARCH 1402. Concurrent enrollment or credit in ARCH 2351. Application of theory and principles to physical planning problems emphasizing functional analyses and interior and exterior spatial aspects of architecture. Outside assignments required.
- *2402. Architectural Design IV (4:3:9).** Prerequisite: ARCH 2401. Concurrent enrollment or credit in ARCH 2352. Continuation of ARCH 2401. Outside assignments required.
- 3311. 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.

3312. **Contemporary Architectural Issues (3:3:0)**. Prerequisite: Junior standing. Architectural responses to philosophical concepts, social exigencies, and physical contexts are studied in built work, hypothetical work, and institutional expectations.
3313. **Contemporary Residential Architecture 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.
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.
3334. **Architectural Conservation (3:3:0)**. The theory and practice of historic preservation and restoration. New economic uses for nonhistoric old structures.
3351. **Construction Drawings (3:2:6)**. Prerequisite: ARCH 3353 (except for dual majors) and 3502. Techniques of building construction, the communication of technical information, and the process of preparing contract documents for construction.
3352. **Construction Drawings and Documents (3:2:6)**. Prerequisite: ARCH 3351. Advanced communication of technical information concerning materials and methods of construction, selection of finish materials, life safety systems, handicapped design, and introduction to specifications.
3353. **Architectural Environmental Systems I (3:3:0)**. Prerequisite: ARCH 2352 and 2402. Introduction and analysis of various environmental systems including plumbing, HVAC, electrical and illumination, acoustics, fire safety, vertical transportation, and the selection process for the systems.
3354. **Architectural Environmental Systems II (3:3:0)**. Prerequisite: ARCH 3353. Systems of building components and assemblies and joinery of those materials, including architectural, structural, and environmental. Analysis of the use of systems for specialized installations, design criteria, sophisticated systems, and contemporary systems.
3361. **Design Workshop (3:3:3)**. Prerequisite: ARCH 2402. Special projects and project development in architectural design. May be repeated for credit.
- *3373. **Environmental Analysis—Site Planning (3:3:0)**. Prerequisite: ARCH 2402. A basic course to develop a working knowledge of the techniques and principles involved in site planning to provide optimum living and working environments.
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.
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.
- *3501. **Architectural Design V (5:3:9)**. Prerequisite: Completion of first- and second-year studies in their entirety. Increasing emphasis upon program research, site analysis, environmental design determinants, architectural materials, and innovative construction methods. Outside assignments required.
- *3502. **Architectural Design VI (5:3:9)**. Prerequisite: ARCH 3501. Continuation of ARCH 3501 with increased emphasis on multi-story construction and building code compliances. Outside assignments required.
4000. **Research in Architecture and Urban Studies (V1-6)**. Prerequisite: Advanced standing and approval of the dean. Individual studies of special interest in advanced architecture, history of architecture, and city planning. May be repeated for credit.
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 2312 and consent of the instructor. The American architectural heritage. Pre-Columbian, southwestern colonial, regional styles of the eastern seaboard, western reserve, and Greek revival. Illustrated lectures.
- 4333. Design Problems in Architecture and Urban Studies (3).** Prerequisite: Advanced standing and approval of the dean. Individual studies of special interest in architecture, history of architecture, and urban design. May be repeated for credit.
- *4353. Advanced Computer Applications (3:2:2).** Prerequisite: ARCH 2353. Continuation of the principles of ARCH 2353. Advanced computer graphics applications, programming, and contract document systems.
- *4361. Architectural Studies Seminar (3:3:0).** The study, presentation, and discussion of issues regarding architecture as an aspect of culture and considering the processes and products.
- 4381. Urban Design and Planning (3:3:0).** Prerequisite: ARCH 3502. Comprehensive background in planning principles which will contribute to a useful understanding of architecture in an urban society and environment.
- 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).** ARCH 4381 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. Architectural Professional Practice (3:3:0).** Prerequisite: ARCH 4502. The principles and practices of architectural business, including the discussion of professionalism, administration, management, legalities, and liabilities. Exploration of current, advanced, complex processes for the delivery of architecture.
- 4392. Architectural Professional Practice Seminar (3:3:0).** Prerequisite: ARCH 4391. A continuation of ARCH 4391 in seminar format. Advanced topics will be explored in depth for presentation and documentation. Special emphasis will be placed on ethics, values, and the future of the architecture profession.
- 4393. Project Planning and Construction Management (3:3:0).** Prerequisite: ARCH 4502 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. Architectural Programming (3:3:0).** Prerequisite: Senior standing. A study of the methods and processes involved in programming architectural projects.
- *4395. Thesis Research and Programming (3:3:1).** Prerequisite: ARCH 4502, approved thesis topic, and fifth-year standing. Individual study, research, and conferences to develop a program for a comprehensive architecture thesis project in ARCH 4692. Outside assignments as required by the thesis committee.
- 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.
- *4501. Architectural Design VII (5:3:9).** Prerequisite: ARCH 3502. Emphasis on complex architectural problems and urban systems; evaluation of environmental considerations. Outside assignments required.

- *4502. **Architectural Design VIII (5:3:9).** Prerequisite: ARCH 4501. Continuation of ARCH 4501. Outside assignments required.
- *4591. **Architectural Design IX (5:3:9).** Prerequisite: ARCH 4502. Emphasis on multi-building projects; site planning, transportation-circulation, and contributions of architecture to the urban fabric. Outside assignments required.
- *4692. **Architectural Design X-Thesis (6:3:12).** Prerequisite: ARCH 4591 and 4395. Development and design of a comprehensive architectural thesis project programmed in ARCH 4395. Outside assignments as required by thesis committee.



College of Arts and Sciences

Professor J. R. Goodin, *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 Aerospace Studies, Military Science, and Naval 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 some 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.

General Education Requirements. The University established General Education requirements for all students, effective in the fall semester 1989. Briefly, these requirements ensure breadth in each academic program.

Students who entered Texas Tech for the first time in the fall 1989 must consult their academic dean regarding specific General Education course requirements. Students are urged to seek advisement prior to their first enrollment to avoid losing credit.

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 not have 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.

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 or 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.

Freshmen should not enroll in junior-senior level courses.

Arts and Sciences Undeclared. Freshmen or sophomores may be admitted to a general area known as "Arts and Sciences Undeclared" until they select the major degree program in which they intend to graduate. The College of Arts and Sciences offers a broad area of education that includes the social sciences, arts, and humanities, as well as the natural sciences and mathematics. Arts and Sciences Undeclared is only a temporary area of study because students cannot earn a degree in this area. Students within the College of Arts and Sciences are allowed to focus on fulfilling general degree requirements during their first two years. This alleviates the pressure to make an immediate decision on a major and career. Students can use their first two years to build a strong academic foundation. At the same time, students can investigate career alternatives and take elective courses in those professional fields or subject areas that are possible majors. Students listed as undeclared are advised by academic counselors in the dean's office of the College of Arts and Sciences to help with the selection of general degree requirements, electives, and choosing a major. After taking

courses that are required for most majors (for example, English, American history, political science, and mathematics), the student has the flexibility to begin working toward any of the major fields offered within the College of Arts and Sciences. **ONLY STUDENTS WITH FEWER THAN 75 HOURS MAY BE LISTED AS ARTS AND SCIENCES UNDECLARED.** Students who have completed 75 or more hours will have a hold placed on their records until a major is declared.

Degree Plan. Every student with a declared major must file a degree plan with the dean's office upon completing 64 semester hours.

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. Changes in state laws make it imperative that students, especially incoming students, refer to the section of this catalog describing teacher education and consult with the chairperson or undergraduate advisor of the department in which they wish to major.

General Degree Requirements

All Arts and Sciences baccalaureate degrees incorporate, as indicated, University General Education requirements effective fall 1989.

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 and fine arts, 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.

General Requirements

(See section on Undergraduate Credit by Examination for information on credit provided by test scores for these 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. A course may not be counted in two areas.

	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, COMS 1301, or ENGL 2309 may be used to fulfill the final 3 hours of this requirement.	
2. Oral Communication	3
COMS 2300 or any 3 hours approved for General Education may be used to fulfill this requirement.	
3. Foreign Language	6-14
A student must complete 6 hours at the sophomore level or above in a single language. If 4 or more semesters of high school foreign language are accepted for admission, the student should consult the information preceding the course listing for the appropriate foreign language department. A student enrolling 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. International 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, international students may not receive credit for courses in their native language which are numbered below 4000. For more information, consult either the Department of Classical and Romance Languages or the Department of Germanic and Slavic Languages.

4. Mathematics and Logical Reasoning 6
 PHIL 2310 or 4310 may be used to satisfy 3 hours of this requirement. MATH 0301 and 0302 may not be used to fulfill any part of this requirement.

5. Natural Science 8-11
 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 11 hours. The first 8 hours of a student's requirement must come from approved laboratory courses in the following areas: ANTH 2300, astronomy, atmospheric science, biology, chemistry, entomology, geology, geophysics, physical geography, physics, or zoology. Additional required hours must come from the above areas or from ANTH 3310, 3311, 4341, A&SH 3302.

6. Technology and Applied Science 3
 Courses must be selected from the General Education approved list.

7. Social and Behavioral Sciences 6
 Three hours must come from courses in individual or group behavior approved for General Education. The other three hours may come from the same list or from anthropology, economics, †geography, †political science, †psychology, †sociology, social welfare. Mass Communications majors may not use ADV 4313 or JOUR 4330 to satisfy any part of this requirement.

†Excluding any course in this subject cited as an option for any other requirement.

8. American History 6
 Students will normally enroll in HIST 2300 and 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. Student should consult the Department of History.

9. Political Science 6
 Students will enroll in POLS 1301 and normally in 2302. Credit by examination for part of this requirement is available, but 3 hours must be taken in residence. For more information, see the political science section of this catalog.

10. Humanities 6
 Classical and romance languages, English (except technical writing), Germanic and Slavic languages, history, philosophy (except PHIL 2310, 3310, 3321, 3323, 3331, 4310), A&SH 3301, ANTH 3323, 3325, 3346, 3351, CLAS 1320, 3320, 3330, *3340, 3350, HUM 2301, 2302, LAAS 2300, 4300, POLS 3330, 3331, 3332, 3333, 3334, COMS 3311, TH A 2305.

11. Fine Arts 6
 Art (except ART 3311), ARCH 1212, 1341, 1342, architecture history, A&SH 3304, DAN 1204, 3313, FADS 1301, M AP 1001, 4002, 1124, 1223, 1224, 2123, 2124, 2133, 2134, 3205, M CP 1201, 1202, M EN 3101, 3102, 3103, 3104, 3105, 3106, 3201, 3202, 3204, M LT 1301, 1302, 1308, 2301, 2302, 2308, 2309, 3304, 3308, M TH 1300, 1301, 1403, 1404, PALA 3302, 3306, 3307, TH A 2301, 2302, 2303, 2304, 3308, 3309, 4303.

*Does not satisfy General Education requirements.

12. Physical Education 2
 Approved courses in personal wellness and fitness, exercise and sport sciences, dance, marching band, nutrition, health, or ROTC may be used to fulfill 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 approval of the Dean of the College of Arts and Sciences).

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 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 8 hours of personal fitness and wellness, and exercise and sport sciences activity courses may be counted except for students offering exercise and sport sciences as a major, minor, or specialization; not more than 24 hours in the technical or professional subjects of agriculture, architecture, business administration, education, engineering, and/or home economics may be counted; (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. 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. In addition, there is a special track of the program designed for students 25 years of age or older whose careers and/or intellectual interests are such that they feel a traditional major-minor will not serve their needs and whose career commitments prevent their completing all courses in residence.

The general studies program is supervised by the Director of General Studies and an advisory committee composed of four faculty 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 Professor Georgette Gettel-Pearson, Director, Bachelor of General Studies Program, School of Music. Any exception to the degree requirements must be approved by the director and advisory committee.

Admission Requirements

1. Minimum of 30 hours—sophomore standing.
2. Completion of G ST 1300—preparation of individual plan of study for the Bachelor of General Studies.
3. Approval by the director and advisory committee of the student's proposed plan of study following committee interview.

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. Students who fall below this average for more than one semester will be dropped from the program.

The following degree requirements apply to students who entered Texas Tech for the first time in fall 1989 or later. Students who entered prior to fall 1989 should consult the Director of the Bachelor of General Studies Program. General Degree Requirement courses will be chosen from the approved General Education Course Inventory.

Semester Hours

- | | |
|---|-----|
| 1. English | 6 |
| 2. Oral Communication | 3 |
| 3. Required Political Science and History | 12 |
| 4. Mathematics and Logical Reasoning | 6 |
| 5. Natural (Laboratory) Science | 8 |
| 6. Technology and Applied Science | 3 |
| 7. Individual and Group Behavior..... | 3 |
| 8. Humanities and Fine Arts..... | 6 |
| 9. Physical Fitness and Welfare, Marching Band, ROTC, or Nutrition. | 2 |
| 10. 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. | |
| 11. 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 no later than the first semester of the senior year. The course may be repeated for credit with prior approval of the Director of the Bachelor of General Studies Program. | |
| 12. Completion of the above requirements and the approved plan of study plus electives to total a minimum of 125 semester hours, including at least 45 hours at the junior-senior level (with a minimum cumulative grade-point average of 2.00). Ninety of the 125 hours will be completed in the College of Arts and Sciences. | |
| 13. Implementation of the Foreign Language admission requirement may be deferred until Fall 1991. | |

Bachelor of Fine Arts. The curriculum leading to the Bachelor of Fine Arts degree provides highly professional programs in theatre arts, art, design communication, and studio areas.

	Semester Hours
1. English	12
2. Required Political Science and History	12
3. Oral Communication	3
4. Mathematics and Logical Reasoning	6
5. Laboratory Science and Technology	11
6. Social and Behavioral Science**	0-3
7. P.E., Band, ROTC, or Nutrition	2
8. Theatre Arts or Art and Art History*	93
9. Foreign Language*** (Admission Requirement)	0

Total for degree 139-142

*Requirements vary according to major.

**No additional hours required if ART 3311 is included in upper-level art history requirements for art majors.

***Entering students in Fall 1991 are expected to have two years of foreign language training. Students who do not meet this requirement will be required to take one year of a foreign language.

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 and Biochemistry; Economics; Geosciences; Health, Physical Education, and Recreation; Mathematics; and Physics.

The following are the requirements for this degree:

	Semester Hours
1. English	12
2. Oral Communication	3
3. Foreign Language	6-14
4. Mathematics and Logical Reasoning	6
5. Required Political Science and History	12
6. Natural Science	8
7. Technology and Applied Science	3
8. Social and Behavioral Sciences	3
9. Humanities and Fine Arts	6
May be satisfied entirely or in part within the 12-hour English requirement.	
10. Physical Education, Marching Band, Nutrition, or ROTC	2
11. Major (including a minimum of 24 junior-senior hours)	(minimum) 36
12. Minor (including a minimum of 6 junior-senior 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.	
13. 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. The B.S.I.T. provides understanding of international economic and commercial relationships through

concentrations of course work in international economics, international politics, and international business. This understanding is important for a variety of careers with either direct or indirect international aspects.

The following are the requirements for this degree:

Semester Hours

Basic and General Education Requirements

1. English* (inc. ENGL 2309 & approved humanities ENGL course*) 12
2. Foreign Language* (6 hours at sophomore level or higher) 6-14
3. Mathematics (MATH 1330 and 1331 or more advanced courses)* 6
4. Political Science and History* 12
5. Physical Education, Marching Band, Nutrition, or ROTC* 2
6. Oral Communication* 3
7. Natural (Laboratory) Science* 8
8. Technology and Applied Science* 3
9. Humanities and Fine Arts* 3
10. Individual or Group Behavior* (may be satisfied with courses taken in major) 3

*courses which meet General Education Requirements

Core Requirements

11. Economics and International Economics: ECO 2301, ECO 2302, ECO 3311, ECO 3312, ECO 3330, ECO 3333, ECO 4331, ECO 4332, ECO 4334, and ECO 4333 30
12. International Business, Managerial Economics, and Quantitative Tools: Basic Statistics AECO 3401 or ISQS 2445 or MATH 2300, plus five of the following: ACCT 2303, MKT 4358, MGT 4375, ECO 3320, AECO 4317 ACCT, 3301, FIN 3320, ISQS 3343, ISQS 3344, and AECO 4306 18-19
13. International Political Science, three of the following: POLS 3361, POLS 3371, POLS 3363, POLS 3367, and POLS 4364 9

Other Requirements

- Elective Courses 5-14
- Total for degree (minimum) 126

For more information and academic advisement, contact the Department of Economics.

Bachelor of Science in Physical Education. Recent State legislative action indicates that this degree be phased out. After September 1, 1991, individuals applying for a teaching certificate in Texas *must* hold a bachelor's degree in an academic or interdisciplinary field *other than education*. Information about the B.S. in P.E. degree is provided only for those students who entered the program under previous catalogs. New students desiring to major in exercise and sport sciences, recreation and leisure services, or dance should pursue a standard Bachelor of Science or Bachelor of Arts degree and consult an advisor in the Department of Health, Physical Education, and Recreation.

The following are the requirements for this degree:

Semester Hours

1. English 12
2. Required Political Science and History 12
3. Mathematics (varies with major) 3
4. Psychology (varies with major) 3

- | | |
|---|---------|
| 5. Speech (varies with major) | 3 |
| 6. Laboratory Science (varies with major) | 12 |
| 7. A minor of at least 18 hours including 6 hours of advanced courses is required for 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, Marching 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. Raymond N. Linville, Chairperson, Department of Speech and Hearing Sciences.

The following are the requirements for this degree:

- | | Semester Hours |
|---|----------------|
| 1. English | 12 |
| 2. Oral Communication | 3 |
| 3. Foreign Language | 6-14 |
| A student must complete 9 hours of sign language or 6 hours at the sophomore level or above in a single language. | |
| 4. Mathematics and Logical Reasoning | 6 |
| 5. Required Political Science and History | 12 |
| 6. Natural Science (including ZOOL 2403 or equivalent) | 8 |
| 7. Technology and Applied Science | 3 |
| 8. Social and Behavioral Sciences | 3 |
| 9. Humanities and Fine Arts | 6 |
| May be satisfied entirely or in part within the 12-hour English requirement. | |
| 10. Major (including a minimum of 24 advanced hours) | 36-48 |
| 11. Minor (including a minimum of 6 advanced hours) | 18 |
| 12. Physical Education, Marching Band, Nutrition, or ROTC | 2 |
| 13. Adjunct Requirements | As needed |
| Total for degree | 125-133 |

Bachelor of Music (with Teacher Certification). The Bachelor of Music (with Teacher Certification) degree is for the student who expects to teach classroom music or to direct choral or instrumental music in the public schools.

Pursuant to Senate Bill 994, the undergraduate music education curriculum, at press time, is under revision. Please consult with a music education advisor in the School of Music.

Bachelor of Music (Performance). The Bachelor of Music (Performance) degree is undergoing revision to incorporate elements of General Education. Students who entered Texas Tech prior to fall 1989 must complete the following requirements:

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 electives to total a minimum of 130-140 semester hours, depending upon the major, not including physical education, band, or ROTC.
5. Physical Education, Marching Band, ROTC, or Nutrition 2
- Total for degree 132-144

Students entering Texas Tech in fall 1989 or later should consult an advisor in the School of Music.

Interdepartmental, Interdisciplinary, and Special Programs

Asian Pacific Rim Area Studies. An interdisciplinary minor in Asian Pacific Rim Area Studies for a baccalaureate degree consists of related work from several departments in the College of Arts and Sciences. The minor program is appropriate for students who wish to gain a better and broader understanding of the countries and cultures in the Asian Pacific Rim region. The program is designed to prepare students for further study in several fields, and to provide them with basic qualifications for a wide variety of professional and/or academic careers requiring more specific knowledge of this increasingly important world region and its peoples.

Eighteen hours of course work are necessary for the Asian Pacific Rim Area Studies minor, and they may be taken from designated courses in the fields of anthropology, architecture, Chinese and Japanese languages, economics, geography, history, philosophy, political science, and sociology. This eighteen-hour requirement may not include courses taken to fulfill requirements in the student's major field. Students can obtain further information from the program's director, Professor Yung-mei Tsai, Holden Hall, (806) 742-2400.

Classical Studies. A minor in Classics for a baccalaureate degree is composed of courses involving the ancient Greco-Roman Civilization. Students may obtain further information from the Director of Classical Studies, James E. Holland, Director of Classical and Romance Languages, 262 Foreign Language Building.

The minor is offered to students wishing to gain some understanding of the Classical Mediterranean culture, as a model of cultural synthesis, as a repository of basic human values, and as a base for understanding our own Western culture.

Eighteen hours of course work are necessary to complete the minor. At least three courses must be Classics courses, while remaining courses may be selected from several areas. Classic courses are CLAS 1320, 3320, 3330, and 3350. Other courses may be chosen from Greek (above 1302 level), Latin (above 1402 level), ART 3310, ENGL 4336, HIST 3340, 4341, 4342, PHIL 3301, and POLS 4331.

The eighteen hours may not include courses taken to fulfill requirements in the student's major field.

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 3 hours must be in a 4000-level course. Students 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 not majoring in a foreign language must complete at least 3 hours of credit at the junior or senior level in a foreign language. Comparative literature minors must take at least 6 hours from the following courses: 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 such departments as Anthropology; Atmospheric Science; Biological Sciences; Economics; Geography; Geosciences; and History; and from some departments in Agricultural Sciences. 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 and stimulation of a greater sense of dignity for minority students. 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 1301, 2301, 2302, 3325, 3331, 3345, 3346, 3371, 4372, ART 4104, 4310, ECO 3302, HIST 3324, 3325, 3326, 4326, 4382, M LT 3304, SOC 3321, 3324, 4362, SPAN 4320, 4322, 4360. Additional information may be obtained from the Director, Dr. James Goss, Department of Anthropology.

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: HLED 2206, 2207, HIST 3322, 3323, 3341, SOC 2331, 3325, 3331, 4349, 4373, S W 3311, 4321, EDEC 2317, HD 2303, 3301, FS 2322, 3320, 3321, 3322, 3324, 3326, 3328, 3332, CEED 1370, FFP 3370, 3374. Additional information about the minor may be obtained from Dr. Karol Kelley, Department of History.

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. Students 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, but an in-depth approach to the understanding of ideas and relationships. Honors courses stress interpretation and analysis of primary materials. Entering freshmen are eligible for honors classes if they have an SAT score of at least 1100, an ACT score of at least 24, or a high school grade point of 3.50 (85) or better, or the approval of the Director of Honors. Students already in college qualify if they have a college GPA of 3.00 or better, or the approval of the director.

At the heart of honors is an imaginative, integrated combination of ENGL 2301, 2302; HIST 2300, 2301; and POLS 1301, 2302. This integrated program combines classroom discussion, led by well-qualified professors, with guest lectures by campus and community experts. A wide variety of departmental honors courses supplement the integrated program and may be used to fulfill

requirements in English, fine arts, humanities, language, and social science. Qualified students may enroll for all or part of the integrated program and for individual honors classes.

Although the honors program is administered through the College of Arts and Sciences, students from any college at Texas Tech may participate. To graduate "In Honors Studies," a student must fulfill normal degree requirements, have at least a 3.00 GPA overall, a GPA of 3.25 or better in honors courses, and must complete at least 24 hours of honors courses, including either a 6-hour senior honors project or two honors seminars. All honors seminars satisfy General Education Requirements. The honors program is administered by the Director of Honors and faculty-student committees, supported by a student Honors Council. For further information, contact the Director of Honors, Room 266, Holden Hall.

Courses in Arts and Sciences Honors. (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 faculty member, who must be either a member of the graduate faculty or approved by the Director of Honors.
- 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.
- 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 faculty member, who must be either a member of the graduate faculty or approved by the Director of Honors.

Humanities. The "humanities" include all academic disciplines that study the creative works of human beings—literary, musical, philosophical, religious, theatrical, and artistic—creatively expressing our visions of life and values for living, which offer us both delight and wisdom. For students who wish to combine and explore several humanities disciplines, the interdisciplinary Humanities program offers a flexible and attractive minor.

In the Humanities 18-hour minor, the student first takes the two 3-hour introductory courses: HUM 2301 and 2302 (see below). Under the director's counsel, the student then takes four advanced courses related to a period of his or her choice: Classical, Medieval, Renaissance, Enlightenment, Nineteenth Century, or Twentieth Century. For interdisciplinary richness, the student selects these four courses from the varied offerings of any three of these

participating areas: Anthropology, Architecture, Art, Classical and Romance Languages, English, Germanic and Slavic Languages, History, Music, Philosophy, and Theatre Arts.

For students majoring in the sciences or professions, the interdisciplinary Humanities minor offers an enriching educational experience. For students already majoring in a single discipline among the humanities, this minor provides a broader awareness of the background of ideas and arts that shape our world. The introductory Humanities courses also fulfill general requirements and provide elective credit.

For more information, contact the Director of Humanities: Dr. Dale Davis, Room 227, English Bldg.

Courses in Humanities. (HUM)

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.

International Studies. An interdisciplinary minor in international studies is offered for students who wish to gain an understanding of how the nations of the world are economically, politically, socially, and culturally interdependent. The minor is made up of a 9-hour core of required courses and 9 hours of electives. The core courses are ECO 3333, International Economics; GEOG 3360, Geography of Mankind; and POLS 3361, International Politics. Substitutions may be made in the core by permission of an advisor when it can be shown that they fit in with the student's major program and academic objectives. Elective courses are selected from among courses that deal with international topics in 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, or Dr. Roger Troub, Department of Economics.

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. Gary S. Elbow, Room 211, Holden Hall.

For the major, 30 semester hours must be completed in the following three areas and five 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 (Portuguese may be substituted for up to 6 hours of this requirement).

Area II (9 hours)

First field: Upper division Latin American content courses in anthropology; sociology; ARCH 4312 or 4313.

Second field: Latin American geography courses.

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 five 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.

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.

Linguistics. The Interdepartmental Committee on Linguistics 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, and Speech and Hearing Sciences. Additional information may be obtained from the committee chairperson, Dr. Rosslyn Smith, Department of Classical and Romance Languages.

Linguistics is concerned with (1) the scientific description and analysis of languages; (2) the study of language in its social and cultural context; (3) the evolution and historical development of language; (4) the formal study of communication systems involving the acquisition and use of language; (5) the relation of language to literature, philosophy, and other fields in the humanities; and (6) human biology and neurology as they affect the use of language. Linguistics shares interests with speech science, psychology, anthropology, sociology, literature, philosophy, and other fields of study. It is, therefore, an interesting and useful minor area for students majoring in these fields and one that can, in many cases, help students in developing an area of academic or professional specialization.

The linguistics minor for the B.A. is made up of 18 hours of courses. Of these, it is required that 3 hours be drawn from Group A (general and introductory linguistics courses), at least 3 hours from Group B (courses dealing intensively with a single language or a restricted group of languages), at least 3 hours from Group C (courses dealing with applied uses of linguistics and historical linguistics), and at least 3 hours from group D (courses relating linguistics to other fields). The remaining 6 hours may be taken from any group.

Group A—ANTH 3305, ENGL 3371.

Group B—ENGL 3370, FREN 4302, 4306, GERM 4301, 4308, LAT 4302, SPAN 4302, 4303.

Group C—EDRD 4343, ENGL 4372, 4373, LING 4311, 4335, SHS 2321.

Group D—ANTH 3351, MCOM 3300, PHIL 4310, 4331, SHS 2323.

The Interdepartmental Committee on Linguistics also administers master's degree specializations in general and applied linguistics.

Prelaw. Interested students should be aware that Texas Tech University does not have a prelaw major program leading directly to law school. Thus, students must choose a major field and receive a bachelor's degree in one of the established degree programs in the College of Arts and Sciences, or elsewhere in the University. This major field should be chosen by the beginning of the junior year.

Schools of law do not specify particular majors or courses as part of their admission requirements. Instead, they expect applicants to be well grounded in the fundamentals of a broad liberal education, to be intellectually mature and able to read, write, and think analytically. Prelaw students should constantly keep in mind the various requirements for the bachelor's degree.

Dr. Otis W. Templer, Department of Geography, Dr. Benjamin H. Newcomb, Department of History, and Dr. Jerome O'Callaghan, Department of Political Science, are the prelaw advisors for students within the College of Arts and Sciences. Regardless of their major academic field, 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 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, 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 for certain courses. Science courses are those required of science majors.

Pre dentistry

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.

Premedicine

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 fitness and wellness. 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 biochemistry, statistics, and psychology; 12 semester hours of English; 6 semester hours each of history and political science (United States); and 2 semesters of physical fitness and wellness. Other recommended courses are cultural anthropology, logic, and ethics. Students should complete 90 or more semester hours and take the Optometry College Admission Test before applying to the professional schools.

Allied Health

Preclinical laboratory science, preoccupational therapy, and prephysical therapy programs consist of the 60 to 90 semester hours of preprofessional course work which is required of a student before being admitted to the professional level in a school of allied health. Most programs require a minimum of 6 to 9 semester hours of English, 6 semester hours each of U.S. history and political science, and 8 semester hours each of biology, chemistry, and physics. Requirements for additional courses in advanced biology and chemistry, computer science, mathematics, psychology, sociology, speech, and statistics vary with each program and with each school of allied health.

Texas Tech University Health Sciences Center School of Allied Health accepts both entering freshmen for the preprofessional level (OT, CLS only) and transfer students for the professional level.

Contact the TTUHSC School of Allied Health for admission information and refer to its section in this catalog.

Prenursing

Students desiring admission to the Texas Tech University Health Sciences 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 Health Sciences Center may enroll in a prenursing curriculum. The prenursing advisor will assist students in selecting appropriate courses. Course requirements vary among schools, but most include English, psychology, sociology, chemistry, zoology, microbiology, statistics, and nutrition. Most collegiate programs also require credits in American history and political science.

In order to avoid complications in transfer, prenursing students should not take courses pass-fail.

Other Preprofessional Health Careers

Students who plan other preprofessional programs such as pre-dental hygiene, preradiologic technology, and prephysician's assistant should consult an advisor in the Preprofessional Health Careers office for further information.

Religion Studies. A minor in Religion Studies for a baccalaureate degree is composed of courses drawn from several departments in the college. Students can obtain further information from the director of the program, Dr. H. Paul Chalfant, Department of Sociology, Room 158 Holden Hall.

The minor is offered to students who wish to enhance their understanding of religion by studying it from a variety of academic perspectives. The program is intended to enable students to place their conception of religion in the broader frameworks of several academic disciplines.

Eighteen hours of course work are necessary to complete the minor, including courses from at least three disciplines. Four of the courses in the minor must be from the core courses and such courses must be taken from at least two disciplines. Courses taken must reflect the study of at least two religious traditions. The 18 hours may not include courses taken to fulfill requirements in the student's major field.

Core Courses: ANTH 3323, CLAS 1320, 3350, ENGL 3332, 4331, HIST 3344, 3391, 4328, 4347, 4349, PHIL 3302, 3324, POLS 3339, SOC 4331.

Other Courses: ANTH 3325, 3346, ART 3313, 3317, 3318, ENGL 2301-H, 2302-H, 4306, HIST 3340, 3348, 3395, 3398, 4374, 4398, PHIL 2320, POLS 3330, 3332.

Departmental Independent Studies: Students may use one independent topics course for the minor when the topic is religion. Prior to registration, the student should consult the director of the program concerning availability of courses and the student's progress in the minor.

Russian Language and Area Studies. A minor in Russian Language and Area Studies for a baccalaureate degree consists of integrated course work in several departments. Students can obtain further information from the director of the program, Dr. Peter I. Barta, Department of Germanic and Slavic Languages, Room 217, Foreign Language Building.

The minor is offered to students who wish to study the Russian language and aspects of culture, politics, and society in prerevolutionary Russia and in the Soviet Union. The program is intended to prepare students for further study and to give them basic qualification for various types of professional work which require knowledge of the Russian language and Soviet-Russian culture and society.

Eighteen hours of course work are necessary to complete the minor. RUSN 1401 and 1402, or their equivalents, are prerequisites of, but do not count towards, the eighteen hours of study. RUSN 2301 and 2302, or their equivalents, are required for all students in the program. In addition to completing the above-mentioned language requirement, the student needs to take twelve hours of courses from a list offered by the departments of Art, Economics, Germanic and Slavic Languages, History, and Political Science. Prior to registration, the student should consult the director of the program concerning the availability of specific courses.

The eighteen hours may not include courses taken to fulfill requirements in the student's major field.

Substance Abuse Studies. The colleges of Home Economics and Arts and Sciences jointly offer an interdisciplinary minor in substance abuse studies (SAS). This minor is designed for students with professional, academic, or personal interest in addictive disorders. It will provide students with an understanding of the physiological, psychological, societal, and familial factors contributing to addiction and the recovery from addiction. It is recommended that courses be taken in this order:

Take this class first: FS 3325, Family Dynamics of Addiction.

Then take these classes in any order: F&N 3325, Nutrition and Addiction; HLED 3308, Health Considerations in Chemical Dependencies; and SOC 4383, Alcohol, Drugs, and Society.

Finally, take these classes after completing all other course work: FS 4325, Treatment of Addictive Disorders, and PSY 4329, Drugs, Alcohol, and Behavior.

The Texas Certification Board of Alcoholism and Drug Abuse Counselors accepts completion of this minor as fulfillment of all required academic hours of training in addictive disorders (additional supervised field work will be required).

Additional information may be obtained from the Program Director, Dr. Carl Andersen, Department of Human Development and Family Studies.

Women's Studies. The University offers an interdisciplinary minor in women's studies. Goals of the minor include helping students reinterpret traditional views 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; one of the courses should be the Women's Studies seminar (WS 4300), preferably taken during the senior year. 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, *4321, ENGL *3331, *4334, *4335, *4337, HLED 2207, ESS 3307, HIST 3322, 3323, 3341, *4399, FS 3321, HD *3318, *3319, MCOM *4301, JOUR *4300, ADV *3160, PHIL *4100, POLS 3326, PSY 4300, COMS 2306, SOC 2331, 3325, 3331, *3337, *4308, WS 4300.

Courses in Women's Studies. (WS)

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 Nancy P. Hickerson, Chairperson.

Professors Dennis, Goss and Mayer-Oakes; Associate Professors Campbell, Johnson, Lamb, and Way; Assistant Professor Hall; Visiting Assistant Professor Gianno.

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.

The Department of Anthropology reflects the broad scope of the discipline. Well-equipped laboratories promote research in archaeology and physical anthropology. Close ties with the Latin American Area Studies, the Women's Studies, and the Bilingual Education programs all promote work in various areas of anthropology. Field trips to Mexico and the Southwest are a highlight of the curriculum.

A student majoring in anthropology must complete 31 semester hours in anthropology, including ANTH 1101, 2300, 2301, 2302 (or 1301), 3303, 3304 or 3345, 3305 or 3351, and 3310 or 3311. With prior departmental approval, 3 advanced hours in related disciplines may be counted toward the major. A grade of C or better must be received in each anthropology course by those working for a major or minor in the subject. No more than 6 hours of field courses may be credited to the major.

Anthropology courses provide distribution credit in the three areas of Arts and Sciences: humanities, natural science, and social and behavioral sciences. Courses so indicated give humanities or natural science credit; some others give social and behavioral sciences credit. In addition, anthropology courses fulfill a variety of humanities and social science requirements in other colleges of the University. Students in these colleges should check with advisors in their major departments to learn which anthropology courses will fulfill their college and General Education requirements.

Teacher Education. ANTH 1301 partially fulfills the multicultural requirement for teacher certification in Texas. Anthropology courses can also be used in the broad field social science program for certification.

Courses in Anthropology. (ANTH)

- 1101. **Physical Anthropology Laboratory (1:0:2).** Optional laboratory for ANTH 2300. Study of human and nonhuman primate skeletons and fossils; blood types, genetics, anthropometry.
- 1301. **Understanding Multicultural America (3:3:0).** Introduction to the variety of cultures in America, designed to foster an appreciation for the diversity and integrity of American cognitive, linguistic, and cultural styles. (Fulfills the State Standard Requirement in Multicultural Education for education majors.)
- 2300. **Physical Anthropology (3:3:0).** Study of human biological evolution and racial variation. Includes principles of human heredity and evolution and discussion of body build, skin color, blood types, and population genetics.
- 2301. **Fundamentals of Archaeology (3:3:0).** An introduction to archaeology and what it has told us about our past, from the earliest beginnings to the birth of civilization.
- 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.)
3300. **Anthropology and Contemporary Life (3:3:0).** The relation of anthropology to topics of current interest in American culture. Content varies. Topics have included anthropology and literature, the writings of Carlos Castaneda, Evolution vs. Creation, and art and archaeology. May be repeated for credit.
3303. **World Ethnology (3:3:0).** Prerequisite: ANTH 1301, 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. **Old 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 Old 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, phonological 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.
3308. **Cultural Ecology (3:3:0).** A comprehensive study of the interaction between human communities and their environments, emphasizing the cultural consequences of changes in this ecological relationship.
3310. **Human Evolution (3:2:3).** Prerequisite: ANTH 2300 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.
3311. **Human Variation (3:2:3).** Prerequisite: ANTH 2300 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.
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 consent of instructor. A study of the archaeological background of aboriginal Americans with a particular interest in artifacts and art and the architecture of past civilizations.
3346. **Ancient Civilizations of Middle and South America (3:3:0).** Prerequisite: ANTH 2301 or 3304 or 3345 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, Blacks, Chicanos, Germans, and other cultural groups of recent times.
- 4000. Individual Problems in Anthropology (V1-3).** Prerequisite: ANTH 1301, 2300, 2301, or 2302 plus advanced standing and consent of instructor prior to registration. May be repeated for credit.
- 4300. History of Anthropology (3:3:0).** Prerequisite: Junior standing or consent of instructor. Survey of main currents in the history of anthropology, including evolutionary, functionalist, and ecological perspectives in sociocultural anthropology, and parallel developments in biological anthropology and archaeology.
- 4301. Field Studies in Anthropology (3:3:0).** Prerequisite: Consent of instructor. Studies in the field of cultural sites and materials, both past and present: archaeological sites, museums, Pueblo Indian villages, and rock art sites. Course may be repeated for credit as area studied changes—Texas, the greater Southwest, or Mexico.
- 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.
- 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.

Department of Art

Professor Terry Morrow, Chairperson.

Professors F. Cheatham, Dixon, Durland, V. Funk, Gibbons, P. Hanna, Howze, Kreneck, and Mittler; Associate Professors Alesch, Bagley, J. Cheatham, Dingus, J. Hanna, Krieger, Moon, Queen, Reed, Smith, Street, and Waters; Assistant Professors Dean, Fuentes, Glover, Steele, and Stinespring; Instructor Harding and Walsh; Part-time Instructors C. Funk and Kennedy.

This department supervises the following degree programs: *Bachelor of Fine Arts* in ART, ART EDUCATION, DESIGN COMMUNICATION, and STUDIO; *Bachelor of Arts* in ART HISTORY; *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 is accredited by the National Association of Schools of Art and Design (the official accrediting body for art).

Degree programs within the department lead to professional development in the visual arts and a liberal education in the visual arts with minors in art that are planned specifically for other degree programs. Nonmajors who

desire experiences in the visual arts as part of their liberal education will find a selection of courses designed for them.

The freshman and sophomore art curriculum is consistent with the art curriculum for higher education approved by the Coordinating Board. The Department of Art at Texas Tech therefore respects the standard art core curriculum with regard to transfer credit.

Entering freshmen studio art majors who score a 4 or 5 on the College Board Portfolio Exam will be exempt from the first drawing course (ART 1324). This means that freshmen students who are awarded this advanced placement can take Drawing II in their first semester and a studio elective in their second semester.

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.

Credits for a course in which a grade of D is earned may not be applied toward fulfilling the major or minor requirements. Most upper-level studio art courses are repeatable for credit and allow for individualized instruction.

Freshman Core. All students majoring 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 Major, B.F.A. Degree. This program is designed to prepare quality art teachers for elementary and secondary schools. The student who completes this program will receive either broadfield-secondary or all-level certification while gaining depth in art.

The B.F.A. degree with an art major requires 75 semester hours of art and art history, 18 semester hours of professional education, and 46 semester hours of General Education Requirements.

General Education Requirements

Semester Hours

English	12
The 12 hours of English must consist of ENGL 1301 and 1302 and two sophomore-level literature courses.	
Oral Communication: COMS 2300 or other approved course*	3
Mathematics and Logical Reasoning: MATH 1320 or higher	6
CLEP allowed. MATH 0301 and 0302 may not be used to fulfill any part of this requirement.	
Natural (Laboratory) Science*	8
Technology: EDIT 2318 or other approved computer course*	3
American History (HIST 2300 and 2301)	6
Students normally will enroll in HIST 2300 and 2301 although any American History course will satisfy this requirement. CLEP allowed for part of the requirement, but 3 hours must be taken in residence.	
Political Science (POLS 1301 and 2302)	6
Credit by examination for part of this requirement is available, but 3 hours must be taken in residence.	
P.E., Band, ROTC, or Nutrition	2
Foreign Language	0

Admission Requirement. Entering students in fall 1991 are expected to have two years of foreign language training. Students who do not meet this requirement will be required to take one year of a foreign language. CLEP allowed.

Professional Education Requirements

All-Level Certification:

EPSY 3330, Educational Psychology	3
EDEL 3386, Interdisciplinary Approaches to Aesthetic Education	3
EDSE 3321, Curriculum Development in Secondary Education	3
EDEL 4000, Student Teaching in the Secondary School	3
EDEL 4000, Student Teaching in the Elementary School	3
EDSE 4320, Teaching in Secondary Schools	3

Secondary Certification:

EPSY 3330, Educational Psychology	3
EDSE 3300, Foundations of Secondary Education	3
EDSE 3321, Curriculum Development in Secondary Education	3
EDSE 4000, Student Teaching in the Secondary School	6

Art Courses

Freshman Core Studio: ART 1320, 1324, 1325, 13431	12
Freshman Art History: ART 1310, 1311	6
ART 2364, 3364, 4363, 4364, 3362, 3365	18
2-Dimensional Studio Art, select from drawing, painting, printmaking, and photography	6
3-Dimensional Studio Art, select from ceramics, jewelry, and metals, sculpture, and textile design	6
Upper-level Art History*	6
ART 3363	3
Studio Art Electives*	18

*Approval of faculty advisor required.

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, publication design, package design, corporate design, and illustration.

The design communication curriculum consists of 93 semester hours of art and art history and 46 semester hours of General Education requirements. The 93 semester hours of art and art history include 12 hours in the freshman core curriculum, 33 hours in the major, 12 hours in the minor option area, 12-15 hours in art history, and 24 hours of art electives. Minor option areas are package design and illustration. Junior and senior level design communication courses require portfolio approval by the design faculty as a condition for admission.

General Education Requirements

English	Semester Hours 12
The 12 hours of English must consist of ENGL 1301 and 1302 and two sophomore-level literature courses. CLAS 1310, COMS 1301 or ENGL 2309 may be used to fulfill the final 3 hours of this requirement. CLEP allowed.	

Mathematics and Logical Reasoning	6
CLEP allowed. Approved courses in logic, computer programming, etc. may be substituted for the last 3 hours of this requirement. MATH 0301 and 0302 may not be used to fulfill any part of this requirement.	
COMS 3308	3
American History (HIST 2300 and 2301)	6
Students normally will enroll in HIST 2300 and 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.	
Political Science (POLS 1301 and 2302)	6
Credit by examination for part of this requirement is available, but 3 hours must be taken in residence.	
Natural (Laboratory) Science and Technology*	11
P.E., Band, ROTC, or Nutrition	2
Foreign Language	0
Admission Requirement. Entering students in fall 1991 are expected to have two years of foreign language training. Students who do not meet this requirement will be required to take one year of a foreign language. CLEP allowed.	

Art Courses

Freshman Core Studio: ART 1320, 1324, 1325, 1331	12
Freshman Art History: ART 1310, 1311	6
Upper Level Art History (including ART 3311)	6-9
If ART 3311 is not included in upper level art history requirements, an additional 3 hours of Individual and Group Behavior must be included under General Education requirements.	
Sophomore Design Communication:	
ART 2350, 2351, 2352, 2353, 2354	15
Junior Design Communication: ART 3351, 3352, 3353, 3350	12
Senior Design Communication: ART 4352	6
Design Communication Minor Option: Packaging or Illustration	12
Studio Art Electives*	18
Art Electives	3-6
Minimum of 40 hours upper-level courses required for graduation.	

*Approval of faculty advisor required.

Studio Major, B.F.A. Degree. This program is planned to offer depth in the studio areas. The B.F.A. degree with a studio art major requires 93 semester hours of art and art history and 46 semester hours of General Education requirements. Upon completion of the freshman foundation courses, students select an area of emphasis from ceramics, drawing, jewelry and metals, painting, photography, printmaking, sculpture, or textile design, with the approval of faculty advisors. One-third of the semester hours in studio art above the core must be outside the student's area of emphasis and must be chosen with advisor approval.

General Education Requirements

Semester Hours

English	12
The 12 hours of English must consist of ENGL 1301 and 1302 and two sophomore-level literature courses. CLAS 1310, COMS 1301 or ENGL 2309 may be used to fulfill the final 3 hours of this requirement.	
Mathematics and Logical Reasoning	6
CLEP allowed. Approved courses in logic, computer programming, etc. may be substituted for the last 3 hours of this requirement. MATH 0301 and 0302 may not be used to fulfill any part of this requirement.	

Oral communication: COMS 2300 or other approved course	3
American History (HIST 2300 and 2301)	6
Students normally will enroll in HIST 2300 and 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.	
Political Science (POLS 1301 and 2302)	6
Credit by examination for part of this requirement is available, but 3 hours must be taken in residence.	
Natural (Laboratory) Science and Technology*	11
P.E., Band, ROTC, or Nutrition	2
Foreign Language	0
Admission Requirement. Entering students in fall 1991 are expected to have two years of foreign language training. Students who do not meet this requirement will be required to take one year of a foreign language. CLEP allowed.	

Art Courses

Freshmen Core Studio: ART 1320, 1324, 1325, 1331	12
Freshman Art History: ART 1310, 1311	6
Upper Level Art History (including ART 3311)	6-9
If ART 3311 is not included in upper level art history requirements, an additional 3 hours of Individual and Group Behavior must be included under General Education requirements.	
Studio Art (to include area of emphasis)	66-69
Minimum of 40 hours upper level courses required for graduation.	

*Approval of faculty advisor required.

Art History Major, B.A. Degree. Students working toward an art history major must complete the freshman core in art, 24 hours of upper level art history courses (to be selected with written consent of an advisor), and the other requirements for the Bachelor of Arts degree.

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.
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.
2334. **Metal and Jewelry Design (3:0:6).** Prerequisite: Freshman art core or departmental approval. Introduction to basic techniques used in metalsmithing and jewelry making. Emphasis on fabrication and design. Outside assignments required. May be repeated for credit.
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. **Media and Technique Exploration for Design (3:0:6).** Prerequisite: ART 2350 and 2354. Exploration and experimentation of various 2-dimensional media, techniques, and drawing styles which are applied in given visual communication contexts. 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.
2354. **Analytical Drawing for Design (3:0:6).** Prerequisite: Freshman art core. Analytical drawing methods and techniques to communicate precise visual information. Outside assignments required.
2364. **The Child and Visual Arts (3:2:4).** Prerequisite: Freshman art core. A study of how children approach the visual arts through their efforts toward artistry and their interest in writing and talking about art.
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 (3:3:0).** An examination of native American cultures of the United States as revealed in ancient and contemporary architecture, arts, and crafts. May be repeated with different emphasis.
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. May be repeated once for credit with different emphasis.
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.
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 or departmental approval. 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. **Printmaking (3:0:9)**. Prerequisite: Freshman art core. Open to beginning through advanced students. In-depth study of printmaking methods of silkscreen, lithography, etching, or woodblock. May be repeated for credit.
3330. **Ceramics (3:0:9)**. Prerequisite: Freshman art core or departmental approval. Wheel throwing methods, glaze application, and decorative techniques in clay. 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. **Advanced Metal and Jewelry Design (3:0:9)**. Prerequisite: Freshman art core or departmental approval. Further study of techniques used in metalsmithing and jewelry design. Development of individual direction and exploration of various media. Outside assignments required. 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.
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 2353, 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 2351 and 2353. Retail packaging and new product introduction. May be repeated once for credit.
3362. **Presentation Techniques (3:0:9)**. Prerequisite: Freshman art core. Centers on the visual and verbal techniques of presentation required by the art professional. Techniques will include slide preparation and other audiovisual media.
3363. **Art and Ideas (3:3:0)**. Various theoretical and critical modalities, principally, Formalism, Structuralism, Marxism, and Semiotics, will be compared in the examination of selected episodes from the history of art.
3364. **The Disciplines of Art (3:2:4)**. Prerequisite: Sophomore standing or departmental approval. A study of the art disciplines emphasizing how they differ and relate and are integral to the comprehensive study of the visual arts.
3365. **Approaches to Criticism in Visual Arts (3:2:4)**. A critical-historical examination of visual art forms directed to assist students in acquiring knowledge and skill required in making and supporting decisions concerning forms of visual expression.
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.
3372. **Visual Arts, Children, and Artistic Development (3:1:4)**. Prerequisite: Sophomore standing. A study of the child and art disciplines that inform the professional and parent for developing effective ways to foster the child's inquiry in art.
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)**. Prerequisite: 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.
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.
4338. **Experimental Sculpture (3:0:9)**. Prerequisite: ART 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.

- 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. Advanced Packaging (3:0:9).** Prerequisite: ART 3356. Advanced problems in retail packaging and new product introduction. May be repeated for credit.
- 4363. Inquiry and the Visual Arts (3:0:9).** Prerequisite: ART 3364 or departmental approval. A study of forms of inquiry used by the aesthetician, art critic, art historian, and studio artist; the relationship of inquiry to art learning.
- 4364. Perspectives on the Visual Arts (3:2:4).** Prerequisite: ART 3364 and 4363, or departmental approval. Designed to promote a synthesis of art concepts. Required for the art professional concerned with the advanced artistic development of young adults.

Department of Biological Sciences

Professor John M. Burns, Chairperson; Professor John S. Mecham, Associate Chairperson.

Horn Professors Baker, Jackson, J.K. Jones; Professors Drew, Goodin, C. Jones, Mitchell, Proctor, Rose, and Rylander; Associate Professors Bilimoria, Coulter, Elliot, Heintz, Held, Holaday, and Willig; Assistant Professors Allen, Blanton, Densmore, Haigler, Jeter, Lefkowitz, Moorhead, San Francisco, Tilton, Werth, and Zak.

This department supervises the following degree programs: *BIOLOGY, Bachelor of Science, Master of Science, Doctor of Philosophy*; *BOTANY, Bachelor of Science, Master of Science*; *CELL AND MOLECULAR BIOLOGY, Bachelor 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, 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, 4407; 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, 3102, 3301, and 3420 plus any four of the following six courses: BOT 3303, 3304, 3401, 3409, 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 cell and molecular biology for the B.S. degree must complete a minimum of 39 hours from this department: BIOL 1403, 1404, 2120, 3301, 3302, 3420, 4320, MBIO 3401; plus three of the following courses, at least one of which must include a laboratory: BIOL 3102, 4300 (counts as a laboratory course), 3406, BOT 3309, 3401, MBIO 4306, 4310, 4402, ZOOL 3303, 3401, 4203, 4304, 4409; plus additional junior or senior level courses in the department (may include the courses above) to complete a 39-semester hour major. This degree requires a chemistry minor, including CHEM 4306, 4307.

Students majoring in microbiology must follow the curriculum approved by the American Society for Microbiology (ASM). This includes a minimum of 36 hours of core courses and additional courses. Required core courses include: BIOL 1403, 1404, MBIO 3401, 4303, 4402, 4406, and 4101 or 4102; plus one of the following courses: BIOL 3406, MBIO 4309, 4401 or 4404. Additional courses must be taken from the following to make a total of 36 hours: BIOL 4100 (limited to 4 hrs.), MBIO 4307, 4310, 4400, ZOOL 3303 and FD T 3301. BIOL 3406, MBIO 4101, 4102, 4309, 4401, and 4404 may be taken to satisfy the additional course requirements if they were not taken to satisfy the core requirements. Microbiology majors must also take the following courses: CHEM 1307, 1308, 1103, 1104, 2401, 3305, 3306, 3105, 3106, 4306, 4307; PHYS 1306, 1307, 1103, 1104; either MATH 1351 or AECO 3401; either C S 1300 or 1302 or any advanced 3 or more credit hour course in computer science.

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, 3102, 3301, 3420; plus at least one course from each of the following pairs of courses: ZOOL 2405 or 4407; 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, for a total of 36 semester hours.

The Department of Biological Sciences encourages undergraduate students to work with professors in research laboratories and projects to obtain first-hand information about research in the life sciences. Opportunities are available in many fields including systematics and evolutionary biology, cell and molecular biology, and in several areas of biotechnology. These research programs have been well received in the past and have proved beneficial to both students and faculty. Students who have been involved in the research projects have received competitive grants, presented papers at scientific meetings, and authored papers published in scientific journals and have gone on to become successful medical doctors, college professors, etc. Interested students should contact their advisor, professor, or the department chairperson.

Students majoring in biology, 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. A chemistry minor is required of cell and molecular biology majors.

For microbiology majors, the chemistry courses required for ASM certification satisfy the requirements for a minor in chemistry.

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. Cell and molecular biology 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.

Biological Sciences Curricula.

Biology		Botany		Cell and Molecular Biology		Microbiology		Zoology	
FIRST YEAR									
BIOL 1403, 1404	8	BIOL 1403, 1404	8	BIOL 1403, 1404	8	BIOL 1403, 1404	8	BIOL 1403, 1404	8
CHEM 1103, 1104	2	CHEM 1103, 1104	2	CHEM 1103, 1104	2	CHEM 1103, 1104	2	CHEM 1103, 1104	2
**CHEM 1307, 1308	6	**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	ENGL 1301, 1302	6
Mathematics	6	Mathematics	6	Mathematics	6	MATH 1351 or		Mathematics	6
P.E., Band, ROTC, or		P.E., Band, ROTC, or		P.E., Band, ROTC, or		AECO 3401	3-4	P.E., Band, ROTC, or	
Nutr.	2	Nutr.	2	Nutr.	2	Additional Mathematics	2-3	Nutr.	2
						P.E., Band, ROTC, or			
						Nutr.	2		
						†Oral Communication	3		
SECOND YEAR									
BIOL 3102	1	BIOL 3102	1	BIOL 2120	1	MBIO 3401	4	BIOL 3102	1
BIOL 3301	3	BIOL 3301	3	BIOL 3301	3	CHEM 3105, 3106	2	BIOL 3301	3
Org. Chem.	4-8	Org. Chem.	4-8	CHEM 3105, 3106	2	CHEM 3305, 3306	6	Org. Chem.	4-8
†English	6	†English	6	CHEM 3305, 3306	6	CHEM 2401	4	†English	6
††For. Lang.	6-8	††For. Lang.	6-8	†English	6	†English	6	††For. Lang.	6-8
†Oral Communication	3	†Oral Communication	3	††For. Lang.	6-8	††For. Lang.	6-8	†Oral Communication	3
Major, minor, or		Major, minor, or		†Oral Communication	3	ASM requirements,		Major, minor, or	
##electives	9-15	##electives	9-15	Major, minor, or		technology, appl. sci.,		##electives	9-15
				##electives	8-10	or electives	4-6		
THIRD AND FOURTH YEARS									
For. Lang.	6	BIOL 3420	4	BIOL 3302	3	ASM requirements	26-28	BIOL 3420	4
#HIST 2300, 2301	6	For. Lang.	6	BIOL 3420	4	C S 1300 or 1302	3	For. Lang.	6
PHYS 1306, 1307	6	#HIST 2300, 2301	6	BIOL 4320	3	For. Lang.	6	#HIST 2300, 2301	6
PHYS 1103, 1104	2	PHYS 1306, 1307	6	CHEM 4306, 4307	6	#HIST 2300, 2301	6	PHYS 1306, 1307	6
POLS 1301, 2302	6	PHYS 1103, 1104	2	MBIO 3401	4	PHYS 1306, 1307	6	PHYS 1103, 1104	2
Major, minor, or		POLS 1301, 2302	6	For. Lang.	6	PHYS 1103, 1104	2	POLS 1301, 2302	6
electives	22-34	Major, minor, or		#HIST 2300, 2301	6	CHEM 4306, 4307	6	Major, minor, or	
		electives	25-37	PHYS 1306, 1307	6	POLS 1301, 2302	6	electives	25-37
				PHYS 1103, 1104	2	Electives	1-3		
				POLS 1301, 2302	6				
				Major, minor, or					
				electives	18-20				
Total hours required	126		126		126-132		126		126

**See chemistry prerequisites.

†See college requirements.

††See foreign language requirements.

‡Any U.S. history course will satisfy this requirement.

§§§ Hours of instruction, communication activities are required, as are 8 hours of technology and applied sciences.

Students who contemplate a professional career in one of the areas of biological sciences are strongly urged to complete one semester of calculus.

Students majoring in biology, botany, cell and molecular biology, 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, cell and molecular biology, microbiology, and zoology are set forth in the accompanying table.

Minors. Students from other departments may minor in biology, botany, cell and molecular biology, microbiology, or zoology. Such students must complete 18 hours in biological sciences, at least 6 hours of which are at the junior or senior level. The minor advisor in biological sciences should be consulted no later than the beginning of the junior year.

Teacher Education. Students who complete a major in biology and satisfy other requirements for the B.S. degree, including 18 hours of professional educational courses, will be qualified to teach high school biology in the public schools of Texas. Required courses include BIOL 1403, 1404, 3301, 3102, and 3420; MBIO 3400 or 3401; BOT 3303 or 3304; ZOOL 2403; ZOOL 3406 or 4407, and at least one of the following: BIOL 3311, 3307, 4305, ZOOL 4312. Also required are PHYS 1306, 1103, 1307, and 1104; CHEM 1307, 1103, 1308, 1104, and 3401 or 3305 plus 3105, or 3306 plus 3106.

Students who major in another field and wish to qualify to teach biology in the high schools of Texas must complete (in addition to other degree requirements including 18 hours of education courses) BIOL 1401 or 1403, 1402 or 1404, and 3301; MBIO 3400; BOT 3303 or 3304; ZOOL 2403, 4407, and one of the following: BIOL 3303, 4305, 3420; ZOOL 3406. Also required are CHEM 1307, 1308, 1103, and 1104.

Students may also satisfy the requirements for the teaching of high school biology under the Multidisciplinary Science Major, with an emphasis in biology. This major is administered by the College of Education. All students must take CHEM 1103, 1104, 1307, and 1308; PHYS 1103, 1104, 1306, and 1307; GEOL 1101, 1102, 1303, and 1403; BIOL 1403 and 1404; ATMO 1300, ASTR 1300 and 1100. Also required under the biology emphasis are ZOOL 2403; BIOL 3301; MBIO 3400, one of BOT 3303, 3304, or 3401, together with 6 to 8 hours from the following: BOT 3303, 3304, or 3401; ZOOL 3406 or 4407; BIOL 3303, 3311, 3420, or 4305.

Other degree options administered by the College of Education include:

Secondary Option for Life-Earth Science. Designed to satisfy requirements for science teachers at the junior high school level. Advisor should be contacted for course requirements.

Elementary Option for Biology. Required courses include BIOL 1401, 1402, and 3301; MBIO 3400; ZOOL 2403 plus BOT 3304 or ZOOL 4407.

Elementary Option for Life-Earth Science. Required courses include BIOL 1401, 1402, and 3301; MBIO 3400; GEOL 1303, 1101, 1304, 1102, 3450, and one of the following: GEOL 3301, 4318, 4322, or 4323.

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. Biology I (4:3:3).** Fundamentals of molecular biology, cell biology, and genetics. First semester of an integrated course recommended for students majoring in biological sciences or related disciplines. May be used in combination with either BIOL 1401 or BIOL 1402 to fulfill general science requirements.
- 1404. Biology II (4:3:3).** Prerequisite: BIOL 1403. Fundamentals of organismal biology, population biology, and biological diversity. Second semester of an integrated course recommended for majors in biological and related sciences.
- 2120. Introductory Cell and Molecular Biology (1:1:0).** An introduction to current areas of research and to recent technological advances in the field of cellular and molecular biology.
- 2313. Ecology and Environmental Problems (3:3:0).** Prerequisite: One semester of introductory biology. An introduction to ecological principles and the analysis of environmental problems from an ecological perspective. 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 Studies in Ecology (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 or 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 (3:3:0).** Prerequisite: Introductory biology and genetics; cell biology recommended. A synthesis of animal and plant development, stressing the basic principles of molecular, cellular, and organismic development.
- 3303. Principles of Ecology (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 semester of general genetics (BIOL 3301) or equivalent. A study of the frequency and transmission of human genetic and chromosomal mutations and the application of this information to individual cases.
- 3406. Cell Culture and Laboratory Virology (4:2:4).** Prerequisite: BIOL 3420 or MBIO 3401 or consent of instructor. An introduction to the principles and methods of cell culture and practical virology including the cultivation assay, characterization, and replication of viruses.
- 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 Culture and Laboratory Virology (4:2:4)**. Prerequisite: BIOL 3420 or MBIO 3401 or consent of instructor. An introduction to the principles and methods of cell culture and practical virology including the cultivation, characterization, and replication of viruses.
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.
4104. **Practical Radiation Safety (1:1:0)**. Covers atomic theory, ionizing radiation, regulations concerning use of radioactive material, instrumentation, and experimental uses of radioactive material.
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.
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.
4306. **Biogeography (3:3:0)**. Prerequisite: One year of introductory biology or consent of instructor. Characterization and analysis of the geographic distribution of organisms, emphasizing ecological and historical aspects.
4314. **Metabolic Regulation (3:3:0)**. Prerequisite: CHEM 4306, 4307 or consent of instructor. A description of the mechanisms associated with regulation of various metabolic processes and the interorgan coordination of metabolism.
4320. **Molecular Biology (3:3:0)**. Prerequisite: BIOL 3302, 3420. Includes the study of molecular processes involved in cellular functioning of eukaryotic and prokaryotic cells and viruses together with recent technological advances in molecular biology research.
4408. **Biological Electron Microscopy (4:1:6)**. Prerequisite: Consent of instructor, BIOL 3420 recommended. Introduction to operation of transmission and scanning electron microscopes and preparation of biological samples. Emphasizes transmission electron microscopy.

Courses in Botany. (BOT)

- 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.
- 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.
- 3409. Developmental Plant Anatomy (4:3:2).** Prerequisite: BIOL 1401 or 1403 or consent of instructor. An introduction to the various cells, tissues, and organs of plants with emphasis on the control of differentiation and development.

Courses in Microbiology. (MBIO)

- 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.
- 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. Chemistry and physiology of bacteria and related microorganisms.
- 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.
- 4309. Medical Mycology (3:2:3).** Prerequisite: MBIO 3401 or equivalent. 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.
- 4400. Practicum in Applied Microbiology (4:0:12).** Prerequisite: Consent of instructor. Practical experience in affiliated governmental, industrial, and medical microbiology laboratories. May not be repeated for credit. Not for major or minor credit.
- 4401. Microbial Ecology (4:3:3).** Prerequisite: A course in microbiology, mycology, ecology, or related area, or consent of instructor. An examination of the population and community ecology of bacteria and fungi, and the roles of these organisms in ecosystem processes.
- 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.
4406. **The Genetics of Microorganisms (4:3:3)**. Prerequisite: MBIO 3401 or consent of instructor. The principles of genetic systems existing among microorganisms, with emphasis upon bacteria and bacteriophages.

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 on 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.
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.
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 4407 recommended. Study of the classification, natural history, and history of mammals. Local 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.
4407. **Natural History of the Vertebrates (4:3:3)**. Prerequisite: One year of introductory biology. Evolutionary relationships, identification, and ecology of vertebrates. Local fauna emphasized. Field trips required.
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 and Biochemistry

Horn Professor David B. Knaff, Chairperson; Professor Richard E. Wilde, Associate Chairperson.

Horn Professors Bartsch and Shine; Welch Professor Robinson; Professors Anderson, Dasgupta, Holwerda, Mills, and Redington; Associate Professors Marx, Quitevis, and Walkup; Assistant Professors Birney, Casadonte, Foley, Harman, Headley, Maekawa, Nakashima, Shaw, Shelly, and Whittlesey.

This department supervises the following degree programs: **CHEMISTRY**, *Bachelor of Arts or Bachelor of Science, Master of Science, and Doctor of Philosophy*; **BIOCHEMISTRY**, *Bachelor of Arts or Bachelor of Science*. Those students seeking graduate degrees may specialize in analytical, inorganic, organic, or physical chemistry or biochemistry.

The Department of Chemistry and Biochemistry offers four undergraduate degree programs in chemistry and biochemistry. One of these degree programs will be appropriate for the student who wishes to pursue a professional career in chemistry or biochemistry or for one who desires a strong undergraduate background in the central sciences of chemistry and biochemistry as preparation for other interests such as health-related professional schools, teaching, or sales. The undergraduate advisor assists the student in selecting courses, fulfilling degree requirements, and career counseling. Highly motivated undergraduate chemistry or biochemistry majors may be interested in conducting an individual research project under the supervision of a faculty member. Such students may wish to obtain a working knowledge of research methods in a specialized area, or simply desire familiarity with a wide range of research instrumentation and techniques. The department also has a very active chapter of the Student Affiliates of the American Chemical Society.

Chemistry. The undergraduate student may take courses leading to a Bachelor of Arts or a Bachelor of Science degree in chemistry. 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 the undergraduate advisor in the Department of Chemistry and Biochemistry prior to registration for a particular minor program.

The Bachelor of Science degree prepares a student for graduate school or a career as a professional chemist. This degree program is technically oriented, requiring greater depth of mathematics, physics, computer science, and chemistry than does the Bachelor of Arts degree. With the heavier chemistry requirement in the B.S. degree program, the student has fewer elective courses for other interests. Completion of the B.S. degree curriculum leads to automatic certification of a student as the recipient of a professional degree by the American Chemical Society.

Chemistry Curriculum, B.S. Degree.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
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, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>18</u>		<u>18</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 3305, Org. Chem. Lect. I	3	CHEM 3306, Org. Chem. Lect. II	3
CHEM 3105, Org. Chem. Lab. I	1	CHEM 3106, Org. Chem. Lab. II	1
MATH 2350, Calculus III	3	†Computer sci. elect.	3
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
CHEM 2501, Anal. Chem.	5	#English	3
	<u>16</u>	Minor	3-4
			<u>17-18</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 3201, Adv. Org. Chem. Lab.	2	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
Foreign language	4	#English	3
POLS 1301, Amer. Govt., Org.	3	Foreign language	4
Minor	3-4	POLS 2302, Amer. Pub. Pol.	3
	<u>16-17</u>		<u>18</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 4305, Inorg. Chem.	3	CHEM 4105, Inorg. Chem. Lab.	1
Minor	3	CHEM 4309, Inorg. Chem. II	3
#Indiv. or group behav.	3	Minor	0-6
†Senior elective (chemistry)	3-6	#Oral communication	3
Foreign language	3	††Senior elective (chemistry)	0-3
	<u>15-18</u>	Foreign language	3
			<u>10-19</u>

*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 the departmental undergraduate advisor.

**The science elective must be either BIOL 1401 (Biology of Plants) and BIOL 1402 (Biology of Animals) for BIOL 1403, 1404 (Biology I and II) or GEOL 1303, 1101 (Physical Geology) and GEOL 1304, 1102 (Historical Geology).

†The computer science elective—probably C S 1301 or 1302—will be chosen with the help of the departmental undergraduate advisor.

††Two electives chosen from CHEM 4000 (up to 3 hours), 4300, 4302, 4303, 4308.

#Two courses to be chosen from ENGL 2301, 2302, 2307, and 2308. May be applied towards General Education requirement for humanities.

#General Education requirement.

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 1301, 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
American history	6 hours
POLS 1301, 2302	6 hours
Social or behavioral sciences	6 hours
Humanities	6 hours
Oral Communication	3 hours
Fine arts	6 hours
Foreign language	6-14 hours
P.E., Marching Band, or ROTC	2 hours
Minor requirements and free electives to total a minimum of 125 hours	

Biochemistry. Both the Bachelor of Science and Bachelor of Arts degree programs in biochemistry have a common objective of providing general education and training in the chemical aspects of biological systems through a combination of course work in biochemistry, chemistry, and biology.

Biochemistry Curriculum, B.S. Degree. This degree program will prepare an undergraduate student for graduate study in biochemistry and related disciplines, for entry into medical or dental school, or for employment in industrial or governmental laboratories in which graduate training is not required. Completion of the B.S. degree curriculum incorporates a minor in biology and leads to automatic certification of the student as the recipient of a professional degree by the American Chemical Society.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
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
BIOL 1403, Biology I	4	BIOL 1404, Biology II	4
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
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	18		18

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 3305, Org. Chem. I	3	CHEM 3306, Org. Chem. II	3
CHEM 3105, Org. Chem. Lab. I	1	CHEM 3106, Org. Chem. Lab. II	1
CHEM 2501, Analyt. Chem.	5	BIOL 3301, Genetics	3
PHYS 1308, Prin. of Physics 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
Foreign Language	4	Foreign Language	4
	<u>17</u>	†Computer Science	3
			<u>18</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 4306, Biol. Chem. I	3	CHEM 4307, Biol. Chem. II	3
BIOL 3420, Cell Biology	4	CHEM 4304, Biol. Chem. Lab.	3
MBIO 3401, Prin. of Micro.	4	BIOL 4320, Molec. Biology	3
#English	3	#English	3
Foreign Language	3	Foreign Language	3
	<u>17</u>		<u>15</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
CHEM 3301, Phys. Chem. Biol. Sci.	3	CHEM 4412, Instr. Analysis	4
POLS 1301, Amer. Govt., Org.	3	CHEM 4301, Phys. Biochem.	3
†Senior elective	3-4	POLS 2302, Amer. Pub. Pol.	3
#Indiv. or group behav.	3	Oral communication	3
	<u>12-13</u>		<u>13</u>

*Adequate training in algebra, trigonometry, and analytical geometry is a prerequisite for calculus. The student in doubt as to which mathematics courses to take in the first year must consult with the departmental undergraduate advisor.

†The computer science course—probably C S 1301 or 1302—will be chosen with the help of the departmental undergraduate advisor.

‡One course chosen from CHEM 4000 (3 hrs.), MBIO 4402, and ZOOL 2405.

#Two courses to be chosen from ENGL 2301, 2302, 2307, and 2308. May be applied towards General Education requirement for humanities.

##General Education requirement.

Biochemistry Curriculum, B.A. Degree. This curriculum is primarily designed to prepare an undergraduate student for entry into medical school (admission requirements for Texas medical schools are satisfied) or other medically related professional schools or for industrial employment in areas where a B.A. degree could be an asset, such as in sales or management. The degree program also provides sufficient background in biochemistry and chemistry for a graduate to enter a graduate program in biochemistry.

CHEM 1307, 1308 (or 1301, 1307, 1308), 1103, 1104, 2401,	
3305, 3306, 3105, 3106, 3301, 4306, 4307, 4304, 4412	36 hours
BIOL 1403, 1404, 3301, 3420	15 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
American history	6 hours
POLS 1301, 2302	6 hours
Social or behavioral sciences	6 hours
Humanities	6 hours
Oral communication	3 hours
Fine arts	6 hours

Foreign language	6-14 hours
P.E., Band, ROTC, or Nutrition	2 hours
Minor requirements and free electives to total a minimum of 126 hours	

Advanced Standing. The Department of Chemistry and Biochemistry 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.

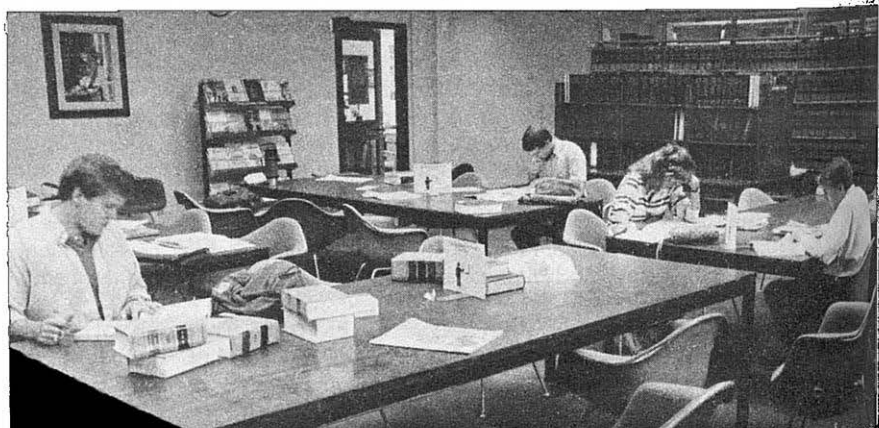
Teacher Education. After September 1, 1991, a person applying for a teaching certificate with chemistry as the teaching field must have received a bachelor's degree with a major in chemistry. There is also an interdisciplinary degree for a person seeking certification for broadfield science. See the appropriate area of this catalog for the teacher certification requirements.

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 which serves as a prerequisite for all advanced laboratory courses in chemistry.
- 1301. Introductory Chemistry (3:3:0).** Basic vocabulary, concepts, and problem-solving skills required for CHEM 1307 and 1308. This course has no laboratory and will not satisfy a laboratory science requirement.
- 1303. Applied Chemistry (3:3:0).** A descriptive approach to selected topics relating chemistry to man and his environment in a modern technological society. No laboratory accompanies this course. Satisfies General Education requirement for technology and applied science.
- 1305. Chemistry and Society I (3:3:0).** A nonmathematical survey of basic chemical concepts, properties, and applications within society. Along with CHEM 1306, 1101, and 1102, it satisfies the laboratory science requirement for nonmajors and those who do not require CHEM 1307 and 1308.
- 1306. Chemistry and Society II (3:3:0).** Prerequisite: CHEM 1305. This course consists of chemical applications within society and the modern chemical world.
- 1307. Principles of Chemistry I (3:3:0).** Prerequisite: High school chemistry or CHEM 1301 and a facility with elementary algebra (a minimum 450 Math. SAT, or its equivalent, is strongly recommended). The fundamental principles of chemistry for students who plan careers in the physical, biological, or medical sciences or 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 and biochemistry 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.
- 3103. Introductory Organic Chemistry Laboratory (1:0:3).** Prerequisite: CHEM 1101, 1102, or 1103, 1104 and concurrent enrollment in or credit for CHEM 3303. Introductory organic laboratory techniques for students in agriculture, home economics, etc.
- 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.
- 3201. Advanced Organic Chemistry Laboratory (2:0:6).** Prerequisite: CHEM 3305, 3306, 3105, and 3106. Advanced synthesis, purification, and analysis of organic compounds. Required for B.S. majors in chemistry.
- 3205. Organic Chemistry Laboratory (2:0:6).** Prerequisite: CHEM 1307, 1308, and 1103, 1104; parallel registration in CHEM 3305 and 3306 required. Techniques of preparative organic chemistry. Required for chemistry majors.
- 3301. Physical Chemistry for the Biological Sciences (3:3:0).** Prerequisite: CHEM 1307, 1308, 1103, 1104; PHYS 1308, 2301, 1105, 1106 or 1306, 1307, 1103, 1104; MATH 1351, 1352. A general physical chemistry course for majors in biochemistry and the biological sciences. Topics: quantum chemistry, thermodynamics, electrochemistry, and kinetics.
- 3303. Introductory Organic Chemistry (3:3:0).** Prerequisite: CHEM 1305, 1306, 1307, or 1308. A brief study of the chemistry of carbon compounds for students in agriculture, home economics, etc.
- 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. CHEM 3305 satisfies the General Education requirement for technology and applied science.
- 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, thermodynamics, chemical and phase equilibria, and solutions.
- 3308. Physical Chemistry II (3:3:0).** Prerequisite: CHEM 3307. The study of kinetic theory, chemical kinetics, electrochemistry, transport properties, surface chemistry, quantum chemistry, and statistical mechanics.

- 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: 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.
- 4300. Individual Studies in Chemistry (3:3:0).** Prerequisite: Consent of instructor. A structured independent studies course under the guidance of a faculty member. May be repeated for credit.
- 4301. Physical Biochemistry (3:3:0).** Prerequisite: CHEM 3301 or 3307, and CHEM 4306, 4307. Applications of physical chemical techniques to proteins, nucleic acids, and membranes.
- 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 (3:3:0).** Prerequisite: CHEM 3305, 3306, 3105, 3106. Molecular descriptions of biological materials and systems. A one-semester course covering molecular approaches to biochemistry and metabolism.
- 4304. Biological Chemistry Laboratory (3:1:6).** Prerequisite: CHEM 4303 or 4306. Techniques for the isolation, purification, and characterization of biomolecular species.
- 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. Biological Chemistry I (3:3:0).** Prerequisite: CHEM 3305, 3306 and 3105, 3106 or 3205, 3206; BIOL 1401, 1402 or 1403, 1404. First semester of a two-semester course in general biochemistry.
- 4307. Biological Chemistry II (3:3:0).** Prerequisite: CHEM 4306. Second semester of a two-semester course in general biochemistry.
- 4309. Inorganic Chemistry II (3:3:0).** Prerequisite: CHEM 4305. A continuation of CHEM 4305. 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 or 3301. Theories and application of instrumental methods of chemical analysis.



Department of Classical and Romance Languages

Professor Robert J. Morris, Chairperson.

Horn Professor Pérez; Professors Andrews, Christiansen, Cismaru, Dietz, Finco, George, Morris, Oberhelman, and Patterson; Associate Professors Bravo, Cravens, Smith, Stratton, and Wood; Assistant Professors Chávez, Churchill, Corbett, Holland, Hopkins, Klock, Larmour, McClendon, and McVay.

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 ethnic studies, linguistics, 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 including a minimum of five 4000-level courses. Specific course requirements may be obtained from departmental academic advisors.

A minor may be obtained in Classics, French, Greek, Italian, Latin, 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. If a transfer student received College Level Examination Program (CLEP) credits at another college, junior college, or university, these credits will be accepted by the department. A major or minor in a foreign language will fulfill the foreign language and humanities requirements for the Bachelor of Arts degree.

Students desiring information on a major or minor in one of these languages should consult the department chairperson for a list of advisors. These advisors can provide information on all aspects of the major and minor programs, including career opportunities. 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.

The regular first and second year foreign language courses (1301 or 1401 through 2302) are sequential. SPAN 1507 may be taken in lieu of SPAN 1401-1402. Successful completion of lower-numbered courses or equivalent competency is a prerequisite for the higher-numbered courses. These higher-numbered courses allow students to pursue their particular interests in language, civilization, and literature. Students enrolled in Spanish have the opportunity to study in Mexico with the annual summer Mexico Field Course program. Students enrolled in Italian have the opportunity to study in Italy with the annual summer Italy Field Course program.

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 bilingual education endorsement and/or secondary or elementary certification in French, Latin, or Spanish should consult with advisors in the College of Education and in the Department of Classical and Romance Languages.

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 (Spanish, French, or Latin) should contact the Department of Classical and Romance Languages before enrolling. Most of these students should take a free departmental placement examination. From these placement examinations, students may earn up to 10 hours of credit (1402, 2301, and 2302). Through personal counseling and/or the placement examination, students will be properly placed in the foreign language sequence. This may be the beginning course (1401) or one at a higher level. Students other than entering freshmen who wish to take the placement examination must have written permission from their respective deans. For information, contact the Department of Classical and Romance Languages.

International 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, Beginning Spanish for Hispanic Students.

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 through the 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.
- 3320. **The World of Greece (3:3:0).** A survey of the literature of ancient Greece from Homer to Plato, together with lectures on culture, society, philosophy, religion, art, and architecture.
- 3330. **The World of Rome (3:3:0).** A survey of ancient Roman Literature in the later republic and imperial centuries, together with lectures on Roman culture, society, religion, and architecture from 1000 B.C. to A.D. 476.
- 3340. **Magic and Ancient Literature (3:3:0).** A study of classical literature (drama, epic, comedy), papyri, dream-lore, and cultural artifacts: emphasis on superstition and religion, irrationalism, and magic and witchcraft.

3350. **Comparative Mythology (3:3:0)**. Ancient myths, their significance in the ancient world and influence on modern literature.

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.

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.

- 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.
3301. **Contemporary France (3:3:0)**. Prerequisite: FREN 2301 and 2302, or equivalent. Survey of the characteristics of French culture and civilization.
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)**. 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)**. 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 Furrées*.
4322. **Civilisation Française: 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.

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 writers. Contents will vary to meet the needs of students. May be repeated for credit with consent of instructor.

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)

1401, 1402. A Beginning Course in Latin I, II (4:4:0 each).

2301, 2302. A Second Course in Latin I, II (3:3:0 each). Prerequisite: LAT 1401 and 1402 or two years 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 writers.

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.

credit with consent of instructor. Independent work under guidance of a staff member.

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. **Beginning Spanish for Hispanic Students (3:3:0)**. Prerequisite: Listening comprehension of informal spoken Spanish. A beginning course designed for Hispanic students educated in the United States who have had exposure to Spanish at home but no formal training in Spanish.

1401, 1402. **A Beginning Course in Spanish I, II (4:3:2 each)**.

1507. **Intensive Spanish Review-First Year (5:5:1)**. Prerequisite: Equivalent of two years high school Spanish, placement exam, or departmental consent. An intensive one-semester review of first year Spanish for qualified students.

2301, 2302. **A Second Course in Spanish I, II (3:3:0)**. Prerequisite: SPAN 1401 and 1402, or two units of high school Spanish. Reading, cultural background, conversation, and composition.

2303. **Intermediate Spanish for Hispanic Students I (3:3:0)**. Prerequisite: SPAN 1303 or placement exam. A second year course designed for Hispanic students educated in the United States who have had exposure to Spanish at home and limited formal training in Spanish.

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. (Includes work in grammar and composition.) May not be taken following 4000-level work.

3328. **Spanish Language Development (3:3:0)**. Prerequisite: SPAN 2301 and 2302 or equivalent and consent of instructor. Development of listening, speaking, reading, and writing skills on location in Mexico. Offered in Mexico each summer.

3329. **Mexican Life and Culture (3:3:0)**. Prerequisite: SPAN 2301 and 2302 or equivalent, and consent of instructor. A basic survey of Mexico, with emphasis on its history and cultural patterns. Offered in Mexico each summer.

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)**. Prerequisite: SPAN 2301 or equivalent, together with consent of instructor and department chairperson. 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.

4302. **Advanced Grammar (3:3:0)**. Spanish language, syntax, and grammar.

4303. **Advanced Conversation (3:3:0)**. Prerequisite: SPAN 4302 or 4307. Development of conversational skills for students who have completed required work in grammar or composition.

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 Spanish literature through selected works and authors.

4312. **Spanish Prose (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. May be repeated once for credit.
4315. **Spanish Short Story (3:3:0).** The rise and development of the Spanish short story up to the present day.
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 Spanish American Literature (3:3:0).** An introduction to Spanish American literature through selected works and authors.
4321. **Spanish American Prose (3:3:0).** Readings of selected prose works of Spanish American literature.
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 Spanish America (3:3:0).** Major post-World War II socio-literary currents; selected readings in the novel, short story, poetry, and theatre.
4324. **Spanish American Drama and Poetry (3:3:0).** Readings of selected dramas and poetry in Spanish American literature.
4325. **The Spanish American Short Story (3:3:0).** The rise and development of the Spanish 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. **Advanced Language Skills (3:3:0).** This course is intended to develop advanced language skills by class work and organized field projects. Special emphasis is given to the development of oral skills. Offered only in Mexico each summer.
4329. **Contemporary Mexico (3:3:0).** A study of the various facets of contemporary Mexico: history, arts, politics, and economics. Offered only 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 United States' 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 Southwest (3:3:0).** Study of similarities and differences between "standard" and "regional" Spanish.

Courses in Linguistics. (LING)

4311. **Applied Linguistics for Foreign Languages (3:3:0).** Prerequisite: FREN or SPAN 3301 and 3302 and 6 hours of education. Linguistics and their usage in the current professional world.
4335. **Linguistic Analysis for Bilingual Education-ESL (3:3:0).** Linguistic analysis (applied, descriptive, and/or contrastive) as it relates to bilingual education or English as a second language.

Department of Communication Studies

Associate Professor H. Dan O'Hair, Chairperson.
Associate Professors Morris and Stewart; Assistant Professors Bliese, Hawkins, Ittis, and Metzger.

This department supervises the following degree programs: COMMUNICATION STUDIES, *Bachelor of Arts*, *Master of Arts*.

Study in communication at Texas Tech is designed to provide training for professionals in business, industry, social service, and education. To accomplish this goal, plans are offered which allow for the study of communication skills and theories and their applications to problems in work and social settings. 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 maintains a local chapter of Delta Sigma Rho-Tau Kappa Alpha (national forensic honorary). The department also sponsors an undergraduate interest group for communication studies, Sigma Theta Kappa. A new addition to the department's offerings is an undergraduate internship in communication studies. The internship, normally completed in the student's last spring semester, provides an opportunity for practice in applied settings.

Students seeking an undergraduate degree in communication studies will complete a course of study which consists of 36 hours of communication studies with at least 18 hours in advanced courses. A minor consists of 18 hours of communication studies with 9 hours in advanced courses. For both the major and minor, students must complete the following courses: COMS 1302 and 2300. Remaining courses may be selected from other departmental offerings.

Teacher Certification. Students desiring secondary certification in communication studies must complete the following: COMS 1302, 2300, 3303, 3314, 4305, TH A 2305, MCOM 1300, and 9 hours of electives, all of which must be advanced. Students may choose to use speech as a specialization for the elementary certificate. These students must take COMS 1302, 2300, 3300, 3303, 3306, and TH A 2305.

Courses in Communication Studies. (COMS)

- 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 communicating with others.
- 1102. **Listening Skills (1:1:0).** A study of the basic factors in effective aural comprehension in various situations, such as lectures and interpersonal relationships.
- 1103. **Voice and Articulation (1:1:0).** Readings, discussion, and practice in the elements of vocalics, with focus on the individual student's personal skills.
- 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. Only freshmen and sophomores may enroll in this course.
- 1302. **Introduction to Communication Studies (3:3:0).** A broad-based introduction to the field of Communication Studies, covering the major content areas in the discipline. Required for all majors and minors.
- 2300. **Public Speaking (3:3:0).** A course in the theory, preparation, delivery, and evaluation of public speeches. May be applied toward oral communication requirement for B.A. degree.
- 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; 2 semester hours may be applied toward Communication Studies major.
- 3300. Nonverbal Communication (3:3:0).** The study of the origin, function, and control of nonverbal, symbolic elements inherent in Communication Studies. May be applied toward social-behavioral sciences requirement for the B.A. degree.
- 3301. Communication in Instruction and Training (3:3:0).** Instructional communication theory applied to the processes of instruction, training, and performance in varied learning contexts. Attention to delivery skills.
- 3303. Small Group Communication (3:3:0).** An introduction to group process and interaction, the concepts of leadership, and effective participation. May be applied toward the social-behavioral sciences requirement for B.A. degree.
- 3305. Communication in Organizations (3:3:0).** A survey of research on communication in organizations with emphasis on relevant verbal and nonverbal factors; applications to basic communication skills and rudimentary research. May be applied toward the social-behavioral sciences requirement for B.A. degree.
- 3306. Intercultural Communication (3:3:0).** A study of the role of cultural differences in human communication; theoretical and experiential approaches toward gaining competence in communicating across cultural barriers. May be applied toward social-behavioral sciences requirement for B.A. degree.
- 3308. Business and Professional 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 interviews and group discussions. May be applied toward oral communication requirement for B.A. degree.
- 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.
- 3310. Theories of Interpersonal Communication (3:3:0).** Prerequisite: COMS 1301 or consent of instructor. A broad-based theoretical approach to the study of interpersonal communication. Applications to a variety of interpersonal communication settings are also discussed. May be applied toward social-behavioral sciences requirement for B.A. degree.
- 3311. Rhetoric in Western Thought (3:3:0).** Explores theories of rhetoric ranging from ancient Greece to modern times. Students examine different conceptions of how rhetoric negotiates public character, social truths, and power. May be applied toward humanities credit for B.A. degree.
- 3312. Gender and 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.
- 3313. 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. May be applied toward social-behavioral sciences requirement for B.A. degree.
- 3314. Argumentation and Debate (3:3:0).** Evolution of argumentation with emphasis on modern viewpoints, application of theory to selected controversies.
- 4301. Senior Projects in Communication Studies (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 Communication Studies. Students required, in advance of registration, to consult with the instructor and secure his or her approval of the specific project to be pursued. May be repeated once for credit.
- 4304. Internship in Communication Studies (3:1:4).** Prerequisite: Consent of instructor. Student internship, under supervision of faculty coordinator, in a selected area of applied communication.

4305. **Communication Competence (3:3:0).** Review of the areas of Communication Studies. A survey of texts and a critical evaluation of their contributions to the discipline; preparation of syllabi.
4309. **Special Topics in Rhetoric (3:3:0).** Prerequisite: Junior standing. Consideration of selected topics in rhetoric. May be repeated for credit.

Department of Economics

Associate Professor Ronald D. Gilbert, Chairperson.

Professors Gilliam, Hill, Jonish, Steinmeier, Troub, and Wittman; Associate Professors Butler and Gurken; Assistant Professors Becker, Chou, Deprez, Magas, and O'Brien; Visiting Assistant Professors Becker and Wesson.

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 2301, 2302, 3311, 3312, 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, and international business. 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)

- 2301. Principles of Economics I (3:3:0).** 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.
- 2302. Principles of Economics II (3:3:0).** An introduction to modern economic society and theories of production and exchange. Emphasis upon monetary and fiscal policy and macroeconomics.
- 2305. Principles of Economics (3:3:0).** An abridged course for students not majoring in economics. Covers the most significant portions of ECO 2301 and 2302, with emphasis upon monetary and fiscal policy. Credit will not be given for both ECO 2305 and 2302.
- 3311. Intermediate Macroeconomics (3:3:0).** Prerequisite: ECO 2302. 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 2301. Intermediate price theory and introduction to welfare theory. Includes theory of demand, theory of the firm, and welfare theory.
- 3320. Managerial Economics (3:3:0).** Prerequisite: ECO 2302. The application of economic theory to problems of business enterprise.
- 3322. Economics of Labor (3:3:0).** Prerequisite: ECO 2302. 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 2301 and 2302. A basic course which deals with the commercial banking system, the Federal Reserve System, and other matters associated with money, prices, and credit control.
- 3324. Taxation and Public Expenditures (3:3:0).** Prerequisite: ECO 2302. 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 2302 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 2301 and 2302. Study of different economic systems, with attention given to selected ones or types (e.g., market economies, Yugoslavia's co-participation, corporate statism, Scandinavian socialism, Soviet central planning).
- 3333. International Economics (3:3:0).** Prerequisite: ECO 2302 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.
- 4314. Development of Economic Doctrines (3:3:0).** Prerequisite: ECO 2302. The basis, nature, and effects of economic doctrines from ancient times through the nineteenth century.

4323. **Monetary Theory (3:3:0).** Prerequisite: ECO 3311. Analysis of money supply, money demand, interest rates, income and price level determination, and transmission mechanisms. Emphases include monetary policies in an open economy context.
4331. **Economics of Multinational Enterprise (3:3:0).** Prerequisite: ECO 2302 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 or 3333 or consent of instructor. Analysis of international monetary system theory, policy, and institutions. Includes attention to foreign exchange markets and roles of international banking and international managerial finance.
4333. **International Economic Relations (3:3:0).** Prerequisite: Senior B.S.I.T. major (preferably in last semester) or equivalent background in international economics, business, and politics. Study of past, present, and possible future nature of international economic relations, with attention to interaction of economic, political, business, and sociocultural factors.
4334. **Economics of Growth and Development (3:3:0).** Prerequisite: ECO 2302 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 Wendell Aycock, Acting Chairperson.

Hon Professors Higdon and McDonald; Professors K. Davis, Langford, Mogan, D. Rude, Sullivan, and Wages; Associate Professors T. Barker, Brewer, Clarke, Crider, Crowell, D. Davis, Dragga, Gilbert, Kuriyama, McBride, C. Rude, Samson, Schoenecke, Shaw, Tanner, and Whitlark; Assistant Professors Ceniza, Conrad, Daghistany, Foster, Hurst, Kemp, Morey, Rodman, Sommerlad, and Whitsitt; Lecturers S. Barker, Bennett, Brown, Carnes, Duke, Hatfield, Hefley, Heise, Jones, Kennedy, McLaughlin, McLure, Myers, Orr, Rylander, Simmons, Soucy, Todd, and Wolf.

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 linguistics and comparative literature at both the undergraduate and the graduate levels.

English majors may specialize in literature and language, in technical communication, or in creative writing. They may also enroll in programs of certification for teaching on both the elementary and secondary levels of public schools. In addition to offering these traditional programs, the English Department has developed a writing center where students may receive individual instruction and three computer facilities where students may learn the most recent techniques in word processing.

The department sponsors the local chapter of Sigma Tau Delta, national English honorary, and a chapter of the Society for Technical Communication. The department publishes three international journals: *Conradiana*, *The Eighteenth Century: Theory and Interpretation*, and *The Writing Center Journal*.

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*.

An English minor consists of 18 hours: ENGL 1302, two 2000-level English courses, and 9 hours of advanced English courses (3000 or 4000 level). Students wishing to pursue a particular area of study (British or American literature, creative writing, linguistics, technical communication, comparative literature, etc.) may do so by taking their three advanced courses in the appropriate area. For example, students wishing to specialize in technical communication must complete the following courses: ENGL 1302, 2309, and another English course at the sophomore level, 3365, 4365, and 4366. Students may choose, however, to take the 9 advanced hours from any of the advanced courses that the department offers. 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.

Written Communication Requirements

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.

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 0301 before they take ENGL 1301. Although ENGL 0301 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.

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 either 2301, 2302, or 2307, 2308 are required 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, 4303, 4304, 4305, 4306
 - B. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319, 3320
 - C. American literature: ENGL 3323, 3324, 3325, 3326, 3327, 3328, 4320
 - D. Advanced writing, comparative literature, language, linguistics: ENGL 3331, 3340, 3351, 3365, 3370, 3371, 4331, 4334, 4335, 4336, 4337, 4341, 4351, 4360, 4365, 4366, 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.

Technical Communications Specialization

The major in English with a specialization in technical communications 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 technical communications 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.

ENGL 1301, 1302, 2309, and a sophomore-level literature course (ENGL 2301, 2302, 2307, or 2308) are required for an English major with a specialization in technical communications. The following eight advanced courses are required:

- I. Technical communications core courses: ENGL 3365, 4365, 4366
- II. Two courses (one each from any two of the following categories):
 - A. ART 1320, 1370, 3350, PHOT 3201, E GR 1306
 - B. COMS 3305, 3308, 3309
 - C. Any course in computer science or information systems and quantitative sciences: examples—C S 1300, 1301, ISQS 2340.
- III. Three advanced English courses (3000 level or above)

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.

Specializing in creative writing requires the consent of the Director of Creative Writing. 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. With permission of the Director of Creative Writing, ENGL 3351 may be repeated for credit, in lieu of one registration in ENGL 4351.)
- III. Four upper-division literature courses from among any one or more of the following categories:

- A. Fiction: ENGL 3316, 3318, 3319, 3326, or 3331
- B. Poetry: ENGL 3317 or 3327
- C. Drama: ENGL 3320, 4304, 4305, or 4320
- D. Period and author courses: ENGL 3300, 3301, 3303, 3311, 3312, 3314, 3315, 3323, 3324, 3325, 4303, or 4306
- E. Comparative literature, criticism, folklore: ENGL 3328, 3340, 3380, 3381, 4331, 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 (the B.S. in Education must be completed before Sept. 1, 1991). A grade of C or higher in all courses is required. Before beginning to take advanced courses, students should successfully complete two courses in freshman English (1301 and 1302) and two courses in sophomore English (2301, 2302, 2307, or 2308). Students wishing to follow any of the degree programs leading to certification should consult with the Director of Undergraduate Studies in English.

Option I. Program for Preparing Teachers at the Secondary Level with English as the Only Teaching Field.

For the English major seeking the degree of Bachelor of Arts and teacher certification on the secondary level, or for the student seeking the degree of Bachelor of Science in Education with certification to teach English on the secondary level (the latter degree must be completed by Sept. 1, 1991), this option requires that students take ten courses from the following categories:

- I. At least one course from each of the following groups:
 - A. British literature before 1700: ENGL 3300, 3301, 3303, 4303, 4304, 4305, 4306
 - B. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319, 3320
 - C. Language: ENGL 3370, 3371, 4372, 4373
- II. Two American literature courses from the following: ENGL 3323, 3324, 3325, 3326, 3327, 3328, 4320
- III. Two courses from the following courses in comparative literature, creative writing, literary criticism, methods: ENGL 3331, 3340, 3351, 4331, 4334, 4335, 4336, 4337, 4341, 4351, 4360
- IV. Three additional courses from any of the courses listed under I, II, or III above, or two additional courses from those courses and ENGL 3380 or 3381

(For advisement on the 18 hours of professional courses required for secondary certification, see the College of Education.)

Option II. Program for Preparing Teachers at the Secondary Level with English as One of Two Teaching Fields.

For the English major seeking the degree of Bachelor of Arts and teacher certification on the secondary level, or for the student seeking the degree of Bachelor of Science in Education with certification to teach English on the secondary level (the latter degree must be completed by Sept. 1, 1991), this option requires that students take eight courses from the following categories:

- I. At least one course from each of the following groups:
 - A. British literature before 1700: ENGL 3300, 3301, 3303, 4303, 4304, 4305, 4306
 - B. British literature after 1700: ENGL 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319, 3320
 - C. Comparative literature, creative writing, literary criticism, methods: ENGL 3331, 3340, 3351, 4331, 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. Two additional courses from any of the courses listed under I or II above, or ENGL 3380 or 3381
- (For advisement on the 18 hours of professional courses required for secondary certification, see the College of Education.)

Option IV. Interdisciplinary Program for Preparing Teachers at the Secondary Level with English as the Only Teaching Field.

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 courses:

- I. At least one course from each of the following groups:
 - A. Comparative literature: ENGL 3331, 4331, 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, 3320
 - 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, 4325
- III. One additional advanced English course. Suggested electives are ENGL 4372 or 4373
- IV. EDSE 4353 or 4354
- V. JOUR 4310 and 4320
- VI. CLAS 1320 or 3350
- VII. Two courses from the following: COMS 1301, TH A 2303 or 2305
- VIII. EDRD 3341, 4342, EDSE 4352
- IX. EPSY 3330, EDBL 3133, EDSP 3131, EDIT 3132, EDSE 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, 3302, 3311, 3312, 3314, 3315, 3323, 3324, 3325
- II. One genre course selected from each of the following:
 - A. Drama: ENGL 3320, 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 Elementary School Teachers with English Specialization (B.S. in Education)

Students seeking the elementary certificate with an English specialization are required to take one course from each of the following groups:

- A. American literature: ENGL 3323, 3324, 3325, 3327, 3328, 4320
- B. Language: ENGL 3370, 3371, 4372, 4373
- C. British literature: ENGL 3300, 3301, 3303, 3311, 3312, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 4303, 4304, 4305, 4306
- D. Comparative literature, writing, criticism, methods: ENGL 3331, 3340, 3351, 4331, 4334, 4335, 4336, 4337, 4341, 4351, 4360

Courses in English. (ENGL)

- 0301. Developmental Writing (3:3:0).** Students are assigned to this course on the basis of testing and evaluation. 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 0301 are in addition to the minimum number needed for graduation. Emphasizes the development of fluency and coherence in writing and in increased capability in usage and grammar.
- 1301. Essentials of College Rhetoric (3:3:0).** Prerequisite: Successful completion of ENGL 1300 or a satisfactory score on SAT, ACT, or English Department writing sample. A student may be required to transfer to ENGL 0301 on the basis of the English Department writing sample. Focuses on the writing process and requires students to write extensively in a variety of modes and styles.
- 1302. Advanced College Rhetoric (3:3:0).** Prerequisite: Successful completion of ENGL 1301. Focuses on writing from sources, research methods, and documentation.
- 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.
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.
3320. **British Drama of the Twentieth Century (3:3:0).** Major drama and dramatic movements from Shaw to the present.
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.
3329. **Literature of the American West (3:3:0).** Survey of literature about the American West from the 16th century to the present.
3331. **Short Story (3:3:0).** Short stories around the world.
3332. **The Bible As Literature (3:3:0).** The styles and forms of biblical lyrics and narration as well as various theories of biblical interpretation.
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. With permission of the Director of Creative Writing, ENGL 3351 may be repeated for credit, in lieu of one registration in ENGL 4351.
3365. **Professional Report Writing (3:3:0).** Prerequisite: ENGL 2309 or consent of instructor. Preparation of professional and academic reports and publications through the use of communication 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).** Concepts of visual and aural communication and a survey of various film genres.
3381. **Futuristic Fiction (3:3:0).** 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.
- 4331. Religion in Literature (3:3:0).** The function of religious images and ideas in British and American literature as well as in works in translation.
- 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. Special Topics in Technical Communication (3:3:0).** Prerequisite: ENGL 3365 or consent of instructor. Development of complex documents, such as manuals, proposals, and newsletters. The course may be repeated once for credit when topics vary.
- 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. Students must be proficient in operating a word processor before enrolling for the course.
- 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 and 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 C. Davidson and Elbow; Assistant Professors Lee; Instructors Aulbach and J. Davidson; Adjunct Associate Professor Dorn.

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 community and urban studies minor programs.

Geography, the spatial science, offers both variety and specialization, with opportunities in many different occupations. The discipline is most appealing to students who enjoy travel and field work, who are observant and curious about the world, and who wish to apply their knowledge and training to working on challenging problems such as developing or implementing community improvement plans, managing natural resources, planning for urban or regional development, and designing or evaluating international development projects. Undergraduate majors will find interesting careers in the public sector with local, state, and federal government agencies and the military. In the private sector, there are increasing demands by business and industry for employees who are trained in field research methods, statistical analysis, cartography, remote sensing, and other skills that may be acquired by geography students. The undergraduate program is also intended to give students a foundation for graduate study, whether in geography or in some related professional field such as urban or regional planning, environmental and resource management, law, or education.

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, physical geography, remote sensing-cartography, or geography education. 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 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 provide laboratory and nonlaboratory science credit. GEOG 1301 (+1101), 1302 (+1102), 3353, and 4401 fulfill various General Education science and technology 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 first. 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 human geography including demographic change, migration, cultural diffusion, ethnic patterns, and spatial characteristics of political and economic systems with emphasis on international topics.
- 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-hand opportunity for observing actual physical and human aspects of study area. 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, including geographical aspects of the development of Texas.
- *3353. Man, Resources, and Environment (3:3:0).** Prerequisite: Introductory physical geography or consent of instructor. Study 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.
- 3358. Geography of Asia's Pacific Rim (3:3:0).** Study of the physical and human geography of Asia's Pacific Rim, emphasizing environmental problems relating to rural and urban land use, resource exploitation, and economic development.
- 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 South America (3:3:0).** Study of the physical and human geography of South America, with special emphasis on contemporary issues.
- 3364. Geography of Middle America (3:3:0).** Study of the physical and human geography of Mexico, Central America, and the West Indies, with emphasis on contemporary issues.
- 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, microwave, Landsat, thermal infrared, and side-look radar.
- *3410. Environmental Change (4:3:2).** Prerequisite: GEOG 1301 and 1302, or equivalent natural science courses. Investigates changes in climate, hydrology, soils, biota

and landforms since the start of the Ice Ages, and the effects of these environmental changes on humans.

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.
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.
4403. **Geographic Information Systems (4:3:2).** Prerequisite: GEOG 3300 or 3303 or consent of instructor. Review of the principles and applications of geographic information systems. Methods of data collection, entry, and interpretation are covered.
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, Chairperson.

Adobe Professor Asquith; Professors Cebull, Chatterjee, Güven, Haragan, Leary, Peterson, Reeves, and Shurbet; Associate Professors Barnes, Barrick, Chang, and Jurica; Assistant Professor Lehman; Instructor Harrison.

This department supervises the following degree programs: *GEO-SCIENCE, 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 geo-

sciences. 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. Programs leading to the Bachelor of Science degree provide more intensive training in the physical sciences.

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, 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.

Students using earth science as a teaching field should consult with the Department of Geosciences and the College of Education.

Bachelor of Science Degree Requirements. All curricula include the general requirements for the Bachelor of Science degree (see "General Degree Requirements, Bachelor of Science"). The specializations in geology and geophysics also require MATH 1350, 1351, and 1352; CHEM 1307, 1103, 1308, and 1104; PHYS 1308, 1105, 2301, and 1106; and a course in computer science; MATH 1551, 1552 may be substituted for MATH 1350, 1351, 1352.

Students desiring an area of specialization in geology should include GEOL 1101, 1102, 1303, 1304, 2405, 3301, 3302, 3320, 3321, 3450, 3600, and 4420 and G PH 2300.

An area of specialization in geophysics requires MATH 2350 and 3350; an advanced physics course; GEOL 1101, 1303 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: GPH 2100, 4321, 4323; GEOL 2405, 3301, 3320, 3321, 3600, 4312, 4319, 4420; 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)

Courses marked with an asterisk may be used in fulfilling natural (laboratory) science requirements. Courses marked with double asterisks may be used in fulfilling technology and applied science requirements.

- *1100. Atmospheric Science Laboratory (1:0:2).** Prerequisite: ATMO 1300 or concurrent. Discussion and practical experience in weather analysis, methods of instrumentation, and observational meteorology.
- *1300. Introduction to Atmospheric Science (3:3:0).** An investigation of atmospheric properties and physical processes which determine current weather events and long-term climate conditions. With ATMO 1100, applies to the natural science requirement of the General Education Curriculum.
- **2301. Weather, Climate, and Human Activities (3:3:0).** Prerequisite: ATMO 1300 or equivalent. Observation and analysis of the impacts of weather and climate on human activity, e.g. storms, climate change, forecasting, weather modification, health, energy, transportation.
- 2402. Physical Climatology (4:3:3).** Prerequisite: ATMO 1300 or equivalent or consent of instructor. An introduction to the study of processes controlling the climates of the earth and their classification.
- **3301. General Meteorology (3:3:0).** Prerequisite: MATH 1551 or equivalent. A basic study of atmospheric processes and the principles which control them.

4201. **Undergraduate Seminar (2:2:0)**. Research and discussion on topics of current interest.
4300. **Independent Studies in Atmospheric Science (3:3:0)**. Prerequisite: Consent of instructor. Independent studies in atmospheric science. May be repeated once for credit.

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 1307 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.
1102. **Historical Geology Laboratory (1:0:2)**. Laboratory study of fossils, geologic maps, and geologic structure.
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.
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.
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.
2201. **Introduction to Crystallography and Crystal Chemistry (2:1:3)**. Prerequisite: CHEM 1307, 1103, and GEOL 1303, 1101. 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.
2405. **Introduction to Mineralogy and Petrology (4:3:3)**. Prerequisite: GEOL 1101, 1303. Introduction to mineral classification, structure, and composition with emphasis on rock-forming minerals. Petrology of common igneous, metamorphic, and sedimentary rocks with emphasis on field identification.
3301. **Geomorphology and Aerial Photointerpretation (3:2:3)**. Prerequisite: GEOL 1303, 1101, 1304, 1102, 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 2405 or G PH 2300. Topics include rock mechanics, folds, joints, faults, structural petrology, and crystalline-rock structures. Laboratory work concerns structural aspects of surface and subsurface mapping and interpretation including the use of stereonet.
3320. **Optical Mineralogy and Petrology (3:2:3)**. Prerequisite: GEOL 2201, 2405. 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 3302. 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.
- 3450. Paleontology and Paleoecology (4:3:3).** Classification, evolution, and paleobiology of invertebrate fossils. Applications of paleontological data in geological dating, correlation, and paleoenvironmental analyses.
- 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.
- 4101. Undergraduate Seminar (1:1:0).** May be repeated for credit.
- 4312. Undergraduate Research (3).** Prerequisite: Senior standing. Independent research in an area of current interest in the geosciences. Prior approval from specific professor required.
- 4318. Geology of Texas (3:3:0).** A comprehensive study of the structure, stratigraphy and economic geology of Texas and parts of adjacent states.
- 4321. Sedimentary Processes (3:3:0).** Prerequisite: GEOL 4420 or consent of instructor. Principles of fluid dynamics important in sedimentation, interpretation of primary sedimentary structures, and description of depositional environment.
- 4322. Physical Oceanography (3:3:0).** Prerequisite: GEOL 1303 or one of the following: GEOG 1301, 1302 or ATMO 1300; 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 1303, 1101, 1304, 1102, and advanced standing. 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.
- 4420. Sedimentology and Stratigraphy (4:3:3).** Prerequisite: Senior standing in geosciences or approval of instructor. Sedimentary textures and structures, classification, petrography, and diagenesis of sedimentary rocks, lithostratigraphy, facies, and basin models.

Courses in Geophysics. (G PH)

- 2300. Introduction to Geophysics (3:3:0).** Prerequisite: GEOL 1303. A basic introduction to solid earth geophysics with emphasis on the internal structure of the earth.
- 4321. Earthquake Seismology (3:2:3).** Prerequisite: G PH 4322, 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.
- 4322. Geophysical Methods (3:3:0).** Prerequisite: GEOL 3302 and MATH 1551. Use of surface gravity, magnetic, and seismic data in prospecting for economic minerals is discussed. Most applications are to problems in petroleum prospecting.
- 4323. Applications in Geophysics (3:1:6).** Prerequisite: G PH 4322 and GEOL 3302. Geophysical methods will be applied to the solution of selected field problems. May be repeated for credit.
- 4324. Introduction to Seismic Interpretation (3:2:3).** Prerequisite: G PH 4322. Study of seismic velocities and their determination from reflection seismic records, well surveys, and sonic well logs. Laboratory emphasis on interpretation techniques.

Department of Germanic and Slavic Languages

Professor Ulrich Goebel, Chairperson.

Associate Professors Bacon and McClain; Assistant Professors Barta and Mitnik; Visiting Instructor Davis.

This department supervises the following degree programs: GERMAN, *Bachelor of Arts*, *Master of Arts*. In addition, the department participates in the interdepartmental programs in linguistics and comparative literature at the graduate level, and in the Russian language and area studies minor at the undergraduate level. (For graduate programs and courses, see *Graduate Catalog*.) Instruction is offered in Russian language and literature with independent study available in other Eastern European languages and literatures.

The department administers a variety of special programs and activities aimed at enriching the educational experience of its students. For example, the department offers frequent special lectures, films, and symposia, as well as a study abroad program every summer in Austria or Germany and every other year in the Soviet Union. The department sponsors the Southwest Center for German Studies, two national honor societies (Delta Phi Alpha in German and "Dobro Slovo" in Russian), and their club activities.

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 four units of German or Russian in high school may enter GERM 3301 or RUSN 3303 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 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 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 participating in the German Study Abroad Program may not receive credit towards a major or minor in German for any course below GERM 2302, unless this course has been completed prior to departure. Students who participate in two German Study Abroad Programs must complete a 33-hour major.

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, two 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 comparative literature studies may include RUS 3301 and 3302.

Teacher Education. For certification purposes, a teaching field is offered in German, with a minimum standard program requiring 24 hours of course numbered 2000 and above. These must include 12 hours of courses on the 400 level.

Courses in Chinese. (CHIN)

1401, 1402. A Beginning Course in Chinese I (4:3:2 each). Introduction and development of the four language skills: listening, comprehension, speaking, writing, and reading.

Courses in Japanese. (JAPN)

1401, 1402. A Beginning Course in Japanese I (4:3:2 each). Introduction and development of the four language skills: listening comprehension, speaking, writing, and reading.

2301. A Second Course in Japanese I (3:3:0). Prerequisite: JAPN 1401 and 1402. Reading, cultural background, grammar review, conversation, and composition.

2302. A Second Course in Japanese II (3:3:0). Prerequisite: JAPN 2301. Reading, cultural background, grammar review, conversation, and composition.

4300. Individual Studies in Japanese (3:3:0). Prerequisite: JAPN 2302 or equivalent. Independent study in the Japanese language under the guidance of a faculty member. May be repeated for credit with consent of instructor.

Courses in German. (GERM)

1401. A Beginning Course in German (4:3:2). Oral practice, elementary reading, and grammar.

1402. A Beginning Course in German (4:3:2). Prerequisite: GERM 1401, or equivalent. Oral practice, elementary reading, and grammar.

2301. A Second Course in German (3:3:0). Prerequisite: GERM 1401, 1402 or two units of high school German. Reading, cultural background, grammar review, and conversation.

2302. A Second Course in German (3:3:0). Prerequisite: GERM 2301. Reading, cultural background, conversation, and composition.

3301. German Life and Literature (3:3:0). Prerequisite: GERM 2301 and 2302 or equivalent. Short stories, poetry, and reading on culture and current issues. Conducted in German.

3302. German Life and Literature (3:3:0). Prerequisite: GERM 2301 and 2302 or equivalent. Short stories, dramas, and poetry. Composition and conversation based on readings. Conducted in German.

3303. Advanced Conversation and Composition (3:3:0). Prerequisite: GERM 2302 or equivalent. Emphasis on fluency in spoken and written German. May be taken concurrently with GERM 3301 and 3302. Conducted in German.

4000. Individual and Group Studies in German (V1-6). Prerequisite: Consent of chairperson. Study in German under the guidance of a faculty member. May be repeated for credit.

4301. Advanced Grammar and Composition (3:3:0). Prerequisite: GERM 3301 and 3302 or equivalent. Review of grammatical structure. Practice in pronunciation and in written and spoken German. May be taken concurrently with GERM 3302.

4302. The Age of Goethe (3:3:0). Prerequisite: GERM 3301, 3302, and 3303 or equivalent. Representative readings from the periods of Storm and Stress and the "Klassik." Conducted in German.

4303. **Nineteenth Century German Literature (3:3:0).** Prerequisite: GERM 3301, 3302, and 3303 or equivalent. 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, 3302, and 3303 or equivalent. An overview of prominent writers from Expressionism to the present, normally with emphasis on a specific genre or literature movement. Conducted in German.
4305. **Readings in German Language and Literature (3:3:0).** Prerequisite: GERM 3301, 3302, and 3303 or equivalent. Readings from a particular period or study of a literary theme. May be repeated for credit with consent of instructor. Conducted in German.
4307. **The Contemporary German Play (3:3:0).** Prerequisite: GERM 2301 or equivalent and consent of instructor. Analysis of several plays, emphasizing problems of staging. The public performance of one play. Special emphasis on German pronunciation. May be repeated for credit with change in content.
4308. **German Phonetics, Diction, and Syntax (3:3:0).** Prerequisite: GERM 3301, 3302, and 3303 or equivalent. Introduction to the International Phonetic Alphabet and to syntax of the German language. Individual laboratory exercises. Conducted in German.

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 equivalent. 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 2301 or equivalent. Practice in every-day Russian conversation, reading and listening comprehension, and translation. Particular emphasis on the civilization of the target country.
3301. **Russian Civilization Through Literature in the Nineteenth Century (3:3:0).** This course will examine how major works of Russian literature in translation, music, and painting depict social, spiritual, and intellectual patterns of life under the Czar.
3302. **Twentieth Century Russian Civilization Through Literature in Translation (3:3:0).** This course will deal with the literature and other arts of the turn of the 20th Century in Russia and with the survival of this pre-1917 cultural tradition among the émigrés and in the Soviet Union.
3303. **Russian Conversation and Composition (3:3:0).** Prerequisite: RUSN 2302 or consent of instructor. The course is designed to increase fluency in the spoken language and proficiency in composition. Taught in Russian.
3304. **Russian Conversation and Composition (3:3:0).** Prerequisite: RUSN 3303 or consent of instructor. Practice in composition and in interpretation of Russian-language television programs and newspaper articles. Taught in Russian.

Courses in Slavistics. (SLAV)

4300. **Individual Studies in Slavistics (3).** Prerequisite: RUSN 2302 or equivalent. Independent study in Slavistics under guidance of a faculty 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 Bobo, Cobb, Owens, Willis, and Wilson; Associate Professors Fields, Hal Knipping, Mason, McNally, Moore, Stuyt, and Williams; Assistant Professors Arterburn, Atkinson, Dornier, McHaney, Monroe, Morrow, Robert, Segrist, Weber, and Wolfe; Instructors Broderick, Drake, Kitten, Murray, Seifert, Stoffregen, and Vick.

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, Master of Education* in PHYSICAL EDUCATION; *Master of Science* in SPORTS HEALTH. In addition the department supervises courses in the health and physical fitness program for students in the University.

The department offers several unique academic programs that prepare individuals for a professional work experience. The Athletic Training program prepares students for a career in the care and prevention of sport injuries, and the Commercial and Industrial Fitness program prepares people to supervise corporate, hospital and commercial fitness-wellness programs. In addition to the normal classroom experiences, many exciting opportunities are available to students such as directing and performing dance productions, teaching and coaching youth sports, working in a park and/or recreation environment, and examining community health and adult wellness problems. Sport in World Cultures (ESS 3308)—a study of the role of sport in society—meets 3 hours of the Teacher Certification and the Social-Cultural Foundation requirement.

Health and Physical Fitness Program. To satisfy the all-University requirement of two hours of health and physical fitness, a student may select from PF&W 1101, 1102, 1103, 1104, 1105, or 1106.

Students needing courses in the special adapted physical fitness and wellness 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—Teaching Area in Health. The curriculum in this area is designed to meet the requirements for certification in Texas at the secondary level.

Certification in Health: Students will complete work on one of the following options:

Option I. HLTH 1300, 1302, 1305, 2300, 2305, 3311, 4301. Electives: Select 12 hours from 1306, 1307, 2302, 3325.

Option II. HLTH 1300, 2300, 3311, 3314. Elective: Select 14 hours from 1302, 1305, 1306, 1307, 2302, 2305, 3325.

Elementary. HLTH 1300, 3311. Electives: Select 12 hours from 1302, 1306, 1307, 2302, 2305, 3325.

Minor. HLTH 1301, 2300, 3311. Electives: Select 9 hours from 1305, 1306, 1307, 2302, 2305, 3325.

Bachelor of Science and Bachelor of Arts—Major in Exercise and Sport Sciences. Students majoring in exercise and sport sciences may choose from one

of the following tracks—teacher certification, nonteaching, or commercial and industrial fitness.

The general academic requirements for the B.S. degree are the same for all three tracks as listed in general degree requirements for the College of Arts and Sciences. The specific requirements for each track are as follows.

Teacher Certification: Students who desire to teach on the secondary level must take ESS 1201, 1202, 2105, 3100, 3205 or 3302, 3301, 3305, 3308, 4303, 4306, and 4307. In addition, students must select two sections of ESS 3200. In the skill development core students must select two dance activities (DAN 2100); one aquatic activity (ESS 2101 or ESS 3204); four individual and dual sports with consent of advisor (ESS 2103); two team activities (ESS 2104); ESS 2102; and ESS 2200.

Students interested in exercise and sport sciences as a major must complete the following laboratory sciences or their equivalents: BIOL 1402, or CHEM 1305 and 1101, or PHYS 1303 and 1101, and ZOOL 2403. One course, EDIT 2318, in technology and applied science is required. (One course, ANTH 1301 or ESS 3308, is required from the individual and group behavior category. In the humanities and fine arts category, it is recommended that 3 hours be selected from humanities and 3 hours from visual and performing arts.)

All Level Certification: 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 DAN 3207, ESS 3208, and ESS 3315.

Athletic Training: Students who wish to become athletic trainers in the public schools must major in exercise and sport sciences and in addition must complete the following courses: ESS 2109, 2209, 3205, 3301, 3302, 3304, 4302 (twice), HLED 2202, 3308, ZOOL 2403, and F&N 3340. 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 meet other requirements as outlined by the College of Education.

Nonteaching: Students who wish to major in exercise and sport sciences but who do not wish to certify to teach will follow the nonteaching curriculum. These students must take ESS 1201, 1202, and 3305 and the skill development courses outlined above. In addition, they must take 18 hours of 3000- and 4000-level exercise and sport sciences courses and select a minor of 18 hours, of which 6 hours must be upper-level courses.

Commercial and Industrial Fitness: Students who wish to major in exercise and sport sciences and follow the commercial and industrial fitness track must take the following courses: ESS 1201, 1202, 3301, 3205, 2103 (weight training), 2103 (conditioning), DAN 2100 (aerobic dance), 3305, 3309, 3310, 4304 (twice), 4308, plus hours from designated related courses. The following laboratory sciences are also required: BIOL 1402, or CHEM 1305 and 1101, or PHYS 1303 and 1101, and ZOOL 2403. One course in technology and applied science is required.

Minor in Exercise and Sport Sciences: Students seeking a minor in exercise and sport sciences will complete work as follows: ESS 1201, 1202, 3305; a minimum of 6 hours chosen from DAN 2100, ESS 2101 or 3204, 2102, 2103, 2104, and 2200 with no more than 2 hours from any area; a minimum of 6 hours from any 3000-4000 exercise and sport sciences courses.

Elementary Specialization. The student who selects exercise and sport sciences as an area of specialization on the elementary level must take the following: ESS 1202, 2201, 2301, 3201, 3207, 3208, 3305, and 4306.

Bachelor of Science 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), 4102 (1-2 semesters, Plan I only), 4104, and 4207. The support areas include DAN 3209, 3313, 4200, 4201, FIN 2320, ESS 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—Teaching Area in Dance. Students who are interested in teaching dance in the public schools should follow this curriculum. The earning of this degree qualifies the student to teach dance at the secondary level. The student must meet all requirements for the B.S. 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, 3206, HLED 3306, DAN 2100 (3 semesters), M TH 1301.

Bachelor of Science and Bachelor of Arts—Major in Recreation and Leisure Services. The department offers a program leading to the B.A. or B.S. degree with a major in recreation and leisure services which qualifies the graduate for positions in the various types of recreation programs offered by numerous groups and agencies. The General Education requirements for the B.A. or B.S. degree will be met. All students majoring in recreation and leisure services take a program consisting of the following courses: RLS 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.

Specialization in Therapeutic Recreation: A 15-hour program in therapeutic recreation is available as part of the Recreation and Leisure Services major. Certification is provided by the National Council for Therapeutic Recreation Certification. Students interested in this program should contact departmental advisors. Students who wish to major in Recreation and Leisure Services and follow the therapeutic recreation program must take the following courses: RLS 1301, 1302, 3301, 3305, 3306, 3307, 4306, 4308, 4324, 4601, plus 24 hours from designated related courses.

Minor Areas of Specialization: (minimum 18 hours) May be taken in business administration, community nutrition, computer science, counseling, economics, environmental studies, ethnic studies, exercise and sport sciences, finance, fine arts, geography, geology, horticulture, journalism, marketing,

mass communications, park administration, 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: RLS 1301, 1302, 2304, 3301, 4308, and 4324.

Courses in Health. (HLTH)

1300. **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.
1302. **Foundations of Health (3:3:0).** Basic knowledge of the health field for persons pursuing a degree in health. Principles of the discipline as well as historical overview will be addressed.
1305. **Human Sexuality (3:3:0).** Examination of the structural and functional traits of sexuality and how they affect well-being; covers relationships, reproduction, and life-style alternatives.
1306. **Health in the Marketplace (3:3:0).** Examines issues concerning selection and utilization of health care services and products including self-care, medical delivery systems, and third party reimbursement.
1307. **Aging and Death (3:3:0).** Examines issues surrounding aging process and eventual death of individual. Biological and physical issues will be addressed.
2205. **Mental Health (3:3:0).** Examines mental health from a preventive health viewpoint. Addresses specific behavior modification techniques that can enhance mental health.
2300. **Field Experience in Health (3:0:6).** Prerequisite: 9 hours of health. Introductory supervised experience in public, community, or private agency. Students gain first-hand experience in the profession by participating in 90 hours of volunteer work.
2302. **Environmental Health and Awareness (3:3:0).** Examines critical issues and relationships affecting biospheric health including personal, community, and international ecology.
2305. **Mental Health (3:3:0).** Examines mental health from a preventive health viewpoint. Addresses specific behavior modification techniques that can enhance mental health.
3311. **Communicable and Chronic Diseases (3:3:0).** Examination of etiology of diseases from a body-systems approach, with special emphasis on sexually transmitted diseases, cancer, and cardiovascular disease.
3313. **Health for Preadolescents (3:3:0).** Prerequisite: Junior standing. An in-depth study of health issues relating to children as well as emphasis on behaviors that would affect health for children.
3314. **Health for Adolescents (3:3:0).** Prerequisite: Junior standing. Study of health factors that affect the adolescent; social, emotional, and physical factors of health will be addressed.
3325. **Health Concerns in Chemical Dependencies. (3:3:0).** A holistic approach to the nonuse, use, and misuse of substances that alter mood and behavior, focusing on the implications to personal health.
4600. **Practicum in Community Health (6).** Prerequisite: Senior standing and consent of instructor. Supervised field experience of 240 hours where student implements health programming through local, state, or not-for-profit health agency.

Courses in Physical Fitness and Wellness. (PF&W)

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.

NOTE: Students majoring or minoring in exercise and sport sciences should not enroll in the above six courses.

Courses in Exercise and Sport Science. (ESS)

1201. Concepts in Exercise and Sport Sciences (2:2:0). An introduction to the professions in exercise and sport sciences including philosophical, historical, and scientific foundations.

1202. Motor Learning (2:1:2). A study of the many aspects of learning and performance of motor skills.

2101. Aquatic Activities (1:0:2). Prerequisite: Swimming proficiency. Skills and knowledge in selected aquatic activities.

2102. Track and Field Activities (1:0:2). Skills and knowledge in track and field activities for men and women.

2103. Individual and Dual Activities (1:0:2). Skills and knowledge in selected individual and dual activities. May be repeated for credit.

2104. Team Activities (1:0:2). Skills and knowledge in selected team activities. May be repeated for credit.

2105. Practicum in Exercise and Sport Sciences (1). Prerequisite: Consent of instructor. Supervised clinical experience in fitness and sport centers.

2109. Scientific Bases of Exercise (Laboratory) (1:0:2). Prerequisite or corequisite: ESS 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). Skills and knowledge in gymnastics for men and women.

2201. Team Sports for Elementary-Age Children (2:1:2). Skills and knowledge in basketball, softball, and volleyball.

2301. Field Sports for Elementary-Age Children (3:1:4). Skills and knowledge in soccer, speedball, speed-away, and flag football.

2304. Motor Skill Development for Children (3:3:0). A study of skills and knowledge basic to proper motor learning and development for children, ages 2-8.

3100. Officiating Team Sports (1:1:0). The ethics, rules, and mechanics involved in officiating selected team sports. May be repeated for credit.

3200. Coaching of Sports (2:1:2). Prerequisite: Consent of instructor. Advanced analysis of selected sports with emphasis on application of mechanical principles, exercises and conditioning training, and organization for competition. May be repeated for credit.

3201. Educational Gymnastics (2:0:4). Skills and knowledge in fundamental movements and gymnastics for elementary-age children.

3204. Elementary Aquatics (2:1:2). Prerequisite: Swimming proficiency. Swimming fundamentals from beginning swimming through lifesaving; may lead to Water Safety Instructor's certificate.

3205. **First Aid (2:1:2).** American Red Cross Standard and Instructors First Aid and Personal Safety course.
3208. **Games for Children (2:1:2).** Indoor, low organization, and lead-up games for children.
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: ESS 3302. Administration of an athletic training program. Includes the use of therapeutic modalities and the advanced care, prevention, and treatment of athletic injuries.
3305. **Scientific Bases of Exercise (3:2:2).** Prerequisite: ZOOL 2403 or consent of instructor. A study of the integration of various physiological systems as they function during exercise and training.
3307. **Women in Sport and Exercise (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. Fulfills the 3 hour requirement in Social Cultural Foundations for teacher certification.
3309. **Development of Fitness Centers (3:3:0).** Applied knowledge designed to facilitate the operation and development of fitness centers, emphasizing development of practical skills for successful guidance of consumer and employee fitness centers.
3310. **Exercise Testing and Prescription (3:2:2).** Prerequisite: 12 hours of core courses, junior standing, and ESS 3305. Physiological theory and its practical application to exercise testing and prescription. Emphasis on hands-on physiological testing.
3313. **Motor Skill Development for Children (3:3:0).** A study of skills and knowledge basic to proper motor learning and development for children ages 5-14.
3315. **Youth Sports and Motor Activities (3:3:0).** A study of skills and knowledge appropriate for boys and girls.
4200. **Psychology of Coaching (2:2:0).** A study of the psychological principles as they pertain to athletic coaching.
4302. **Practicum in Athletic Training (3).** Prerequisite: ESS 3302, 3304, or consent of instructor. Supervised clinical experience in athletic training. May be repeated once for credit.
4303. **Management in Exercise and Sport Sciences (3:3:0).** Basic concepts and practices in the operation and management of exercise and sport organizations.
4304. **Internship in Exercise and Sport Sciences (3:3:0).** Prerequisite: 18 hours of approved departmental course work and instructor approval. Provides observational and managerial opportunities in exercise and sport environments. May be repeated for credit.
4306. **Adapted Physical Activities (3:3:0).** Theory and practice in administering and interpreting screening tests and adapting motor activities to the needs of the handicapped.
4307. **Evaluation of Physical Performance (3:3:0).** A survey of tests used to evaluate status and progress in the cognitive, affective, and psychomotor domains.
4308. **Seminar in Fitness (3:3:0).** Prerequisite: Junior or senior standing. Selected topics on commercial and industrial fitness, including legal implications of exercise-related injuries, concept of wellness, fitness and health, diet and exercise.

Courses in Dance. (DAN)

1102. **Pantomime (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 (2:0:41/2).** A study of modern dance techniques. May be repeated for credit.
- 1304. Ballet (3:0:71/2).** The academic study of ballet from its beginning to the most sophisticated forms. May be repeated for credit.
- 2100. Dance Activities (1:0:2).** Skills and knowledge in selected dance activities. 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.
- 3206. Modern, Folk, and Social Dance Forms (2:1:2).** Prerequisite: Consent of instructor. Techniques and skills of selected dance forms, characteristics of different dance forms, and types of accompaniment used in dance.
- 3207. Rhythms for Children (2:1:2).** Creative movement, singing and rhythmic games, folk and square dances for children.
- 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 and Leisure Services. (RLS)

- 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.
- 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).** Principles and applications of leisure services planning. Emphasis on computer-assisted planning techniques.
3306. **Principles of Therapeutic Recreation (3:3:0).** Prerequisite: RLS 1301. Principles of therapeutic recreation for persons who are mentally ill, developmentally or physically disabled, substance abusers, or members of other special populations.
3307. **Therapeutic Recreation Program Management (3:3:0).** Prerequisite: RLS 3306. Principles of effective delivery of therapeutic recreation, in both clinical and nonclinical settings; individualized program planning, client assessment, activity analysis, documentation, and evaluation of quality care.
4306. **Advanced Methods in Therapeutic Recreation (3:3:0).** Prerequisite: RLS 3306 and 3307. Documentation and evaluation of therapeutic recreation client services; program organization, and management.
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.
4601. **Internship in Therapeutic Recreation (6:6:0).** Prerequisite: Departmental approval. An independent study course providing in-service training practice in therapeutic recreation at a clinical or community site, supervised by a certified T.R. professional.

Department of History

Professor Brian Blakeley, Chairperson.

Hon Professor Kuethe; Professors Barr, Flynn, Hayes, and King; Associate Professors Brink, Carlson, Chong, Collins, Flores, Harper, Howe, Nelson, Newcomb, Steinhart, Traylor, Troyansky, and Twyman; Assistant Professors Abbe, Friedberger, Kelley, Martinez, Miller, Rainger, and Reckner; Visiting Professor Johnson; Visiting Assistant Professor Walker.

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, religion studies, Russian language and area studies, 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. Many students use their undergraduate history major as a preparation for advanced studies in law, medicine, theology, etc.

Students seeking an undergraduate degree in history will complete 30 hours of history including 3 hours from HIST 1300 or 3360 and 3 hours from HIST 1301 or 3361, 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 an art history specialization in conjunction with the Department of Art. It consists of 33 hours including 21 hours of history approved by the undergraduate history advisor, at least 12 of which must be at the advanced level including HIST 4398 and at least 6 hours of 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, 3315, 4310, 4311, or 4312. In exceptional cases, HIST 4397 may be substituted with the prior consent of an art history advisor in the Department of History.

The Department also offers a history major with a history of religions emphasis. This program consists of 36 hours including 6 hours of Western Civilization (HIST 1300-1301), 6 hours of American History, 15 hours of advanced history (including HIST 4398 and 3 hours each in American, European, and Third World), and 9 hours chosen from courses taught outside the department and having an emphasis on the study of religion. At least 9 hours of the history hours must be chosen from the following: HIST 3340, 3344, 3348, 3391, 3398, 4328, 4347, 4349, and 4374. HIST 4397 may be chosen with consent of instructor. All courses must be chosen with the approval of the undergraduate history advisor.

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 undergraduate advisor 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 or minor.

Teacher Education. In the teacher certification programs, history may be used at the elementary level as an academic specialization and at the secondary level as either a teaching field or as part of the composite field of social studies.

As a result of changes in state law, certification programs for students planning to teach history have changed. The Department of History and the College of Education should be contacted for clarification of these changes.

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)
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)
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).** Examines the gender expectations from 1607 to the present that have produced for women and men entirely different experiences, strengths, and perceptions of American history. (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 Mexican-Americans 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 1900 (3:3:0).** Explores American military history from the Colonial period through the Spanish-American War, with an emphasis on strategy and the development of military institutions. (US)
3332. **History of United States Military Affairs since 1900 (3:3:0).** Examines twentieth-century American military history up to the present. (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)

- 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 Western Medicine (3:3:0).** A chronological study of concepts and treatment of disease, and of medicine as a social institution in western culture. (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)
- 3345. The Birth of Europe (3:3:0).** Examines the confrontation between the Later Roman Empire and its barbarian invaders, which ultimately produced new economic, political, social, and cultural structures—a new civilization.
- 3346. The Age of Chivalry (3:3:0).** Medieval Europe from 1000-1450 witnesses the domestication of a warrior aristocracy through chivalric ideals, feudal monarchy, and the rise of a powerful bourgeoisie.
- 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)
- 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)
- 3360. History of England to 1714 (3:3:0).** Traces the economics, social, and political history of England to 1714, emphasizing the development of such unique institutions as parliament and the common law. (E)
- 3361. 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)
- 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)
- 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)
- 3379. A Survey of the Third World (3:3:0).** Prerequisite: Successful completion of HIST 1300, 1301, 2300, 2301, recommended. Three mini-surveys of Asia, Africa, and Latin America, intended primarily, but not exclusively, for teacher certification candidates. (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 to the 19th Century (3:3:0)**. A survey of African history from ancient times to the end of the slave trade in the 19th century. (TW)
3396. **Modern Africa since 1800 (3:3:0)**. Surveys the colonial impact on African political, social, and economic life and the rise of African nationalism and the creation of new nations. (TW)
3398. **The Modern Middle East, 1800 to the Present (3:3:0)**. The history of the Middle East from c. 1800 to the rise of Arab and other nation-states and the coups and revolutions of recent decades. (TW)
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. **Great Leaders of the New Nation, 1800-1850 (3:3:0)**. Biographical treatments of the outstanding men and women who contributed importantly to American development between 1800 and 1850. (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)**. Focuses on the economic, social, political, and diplomatic impact of the transformation of the United States into an urban, 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 1920s, 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 1970s, including political developments, wars, and cultural conflicts. (US)
4308. **The Vietnam War (3:3:0)**. Prerequisite: HIST 2300, 2301, or equivalent. Explores the military, diplomatic, political, and social dimensions of the war from its origins in the 1940s through its conclusion in the 1970s. (US)
4310. **Comparative Frontiers (3:3:0)**. Prerequisite: Junior standing. Traces development of eastern American frontiers to 1830 with attention to comparative frontiers in Australia, Brazil, northern Mexico, South Africa, and Siberia. (US)
4312. **The Frontier and American 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)
4325. **Major Issues in U.S. Women's History (3:3:0)**. Prerequisite: HIST 2300 and 2301, or 3323. In-depth study of the evolution of gender roles, women in literature, the suffrage movement, and modern feminism. (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)
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)
4334. **Science in Modern America (3:3:0).** Prerequisite: Junior standing; consent of instructor. Details historical development of topics in twentieth-century American science, technological applications, and impact on modern American life. (US)
4335. **History of American Seapower (3:3:0).** Prerequisite: Junior standing or consent of instructor. Examines history of the American Navy, organizational and technological development, evolution of strategic planning, impact on foreign relations. (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)
4340. **The Automobile in America (3:3:0).** The automobile as a shaping force in American social, economic, and cultural life. Examines invention, industry, workers, urban growth, public policies, and energy use.
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)
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)
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 of European history from the immediate origins of World War I to the present. (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)
4369. **Twentieth Century Britain (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)
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)
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)
4374. **Love, Death, and Magic in Europe, 1500-1800 (3:3:0).** Topics in social and cultural history. Underside of civilization, population, social structure, family and household, economic growth, and crisis. Attitudes toward love and death, popular religion and culture, witchcraft, violence, revolt. (E)
4375. **Social and Cultural History of Europe, 1800 to the Present (3:3:0).** Modernization; industrialization, urbanization, gender, household, new professions, old occupations, and labor unrest. Bourgeois and working-class culture, avant-garde and masses, war, genocide, Europe today. (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 pre-conquest times down to the present with emphasis on unique characteristics of Brazilian culture in the context of world history. (TW)
4386. **War, Revolution, and Dictatorship in Latin America (3:3:0).** Examines the factors of violence and authoritarian government in Latin American culture and history. (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)
4391. **History of Modern South Africa (3:3:0).** Prerequisite: Junior standing or consent of instructor. Chronological description of the social, economic, and political development of South Africa focused on the emergence of apartheid. (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)
4397. **Readings and Research in History (3:3:0).** Prerequisite: Senior standing and consent of instructor. An independent study course involving in-depth reading and historical 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. May be repeated once for credit.

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.

School of Mass Communications

Professor Jerry C. Hudson, Director.

Professor Hsia; Associate Professors Dean, Harp, Morgan, Saathoff, Schweitzer, and Thornhill; Assistant Professors Bates, Fryman, Harmon, Reddick, Smith, and Womack; Lecturers Kinghorn, Morton, and McVay; Instructors Farnall, Hester, Perez, and Owen.

This school supervises the following degree programs: *Bachelor of Arts in JOURNALISM, ADVERTISING, TELECOMMUNICATIONS, PHOTOCOMMUNICATIONS, and PUBLIC RELATIONS; Master of Arts in MASS COMMUNICATIONS.*

The School of Mass Communications is accredited by the Accrediting Council on Education in Journalism and Mass Communications (ACEJMC).

The school 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 school 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 mass communications writing, law, and theory, the minimum number of semester hours required by the school for the Bachelor of Arts degree has been set at 132 hours with a corresponding maximum number of hours which can be taken in school courses being set at 36-39 hours.

Students enrolling in or transferring into the school for the first time will be designated as general mass communications students.

First semester freshmen enrolling in the school must have scored 23 on the ACT or 1000 on the SAT and/or finished high school in the upper one-fourth of the graduating class. Lacking the requirements, first semester freshmen may be admitted into the school on a provisional basis. Continued enrollment would require 2.50 cumulative GPA in the first 15 hours taken at Texas Tech. Freshmen enrolled in other departments and colleges at Texas Tech may transfer into the school after completing at least 15 semester hours, not including CLEP courses, with a minimum of 2.50 cumulative GPA, including repeated courses.

All transfer students, whether from other disciplines at Texas Tech or other two-year and four-year colleges and universities, must have a cumulative 2.50 GPA to be admitted into Mass Communications. Continued enrollment would require a 2.50 cumulative GPA in the first 15 hours taken at Texas Tech.

All transfer students will enter under the catalog in force at the time of transfer. Freshmen and transfer students must present ACT or SAT scores when entering the school. Transfer students must present transcripts for all courses previously completed.

The change from the general mass communications status, which is not a major, to a specific major or minor will be accomplished after the following requirements are met:

1. Completed the ACT or SAT examination with scores submitted to the school.
2. Made at least a C in ENGL 1300 (if required), 1301, and 1302.
3. Completed the economics requirement with a grade or grades of C or higher.
4. Completed the mathematics requirement with a grade or grades of C or higher.
5. Completed the entry level course in the major-minor-sequence with a grade of C or higher. (The entry level course in Journalism is JOUR 3310; for Advertising, ADV 3310; for Public Relations, P R 3310; for Telecommunications, TELE 3310; for Photocommunications, PHOT 3310.)
6. All students must have a cumulative 2.50 GPA, including repeated courses, at the end of the semester before entering the second required course in the major-minor-sequence.
7. The second required course in the major-minor-sequence is JOUR 3312 for News-Editorial Journalism; JOUR 3314 for Broadcast Journalism; ADV 3351 for Advertising; TELE 3340 for Telecommunications; TELE 3360 for Corporate Telecommunications; P R 3341 for Public Relations; PHOT 3312 for Photocommunications.

Other general rules for all students enrolling in mass communications courses are:

1. The student, regardless of major, must have passed the prerequisite course with a grade of C or higher when enrolling in an upper level course (3000 or above).
2. All adjunct courses required for any major-minor-sequence must be passed with a grade of C or higher and may not be taken pass-fail.
3. Students who make less than a C in a core course or a course required in a mass communications major-minor-sequence must repeat and pass the course with a grade of C or higher prior to graduation.
4. No course may be repeated for credit unless so designated.
5. No course required by the school may be taken pass-fail unless required by a mass communications major-minor-sequence. Courses required of the majors which are taken pass-fail by students prior to enrolling in the school will be evaluated by the director as to acceptance.
6. Prerequisites are governed by the catalog in effect at the time the course is taken.
7. Students in any mass communications major-minor-sequence in the school may not enroll in MCOM 1300 after having completed 64 or more hours without the permission of the Director or Associate Director of the School of Mass Communications.
8. Students in majors and sequences in the school must take the following core courses: MCOM 3300, MCOM 3320, JOUR 3309, or JOUR 3310.
9. Sophomore standing (at least 31 hours) is required for entry into 3000-level courses in the school if prerequisites are not stated.
10. Junior standing (at least 61 hours) is required for all 4000-level courses in the school if prerequisites are not stated.
11. All students in majors and sequences are required to select a minor outside the school and complete a minimum of 18 semester hours, at least 6 of which must be on the junior-senior (3000-4000) level.
12. Students enrolled in any major or sequence in the school must take 12 hours of English courses without substitution for the final 3 hours.

Journalism Major. Students majoring in news-editorial (journalism) are required to complete 36-39 semester hours within the school, including the following courses: JOUR 2300, 3310, 3312, 3350, 4370, 4380, MCOM 3300, 3320 and PHOT 3310.

Also required are ECO 2305, PHIL 2320, and MATH 2300 or ISQS 2445.

Broadcast Journalism Sequence. Students in this sequence are enrolled as journalism majors and are required to complete 36-39 semester hours within the school, including the following courses: JOUR 2300, 3310, 3312, 3314, 4370, JOUR 3350 or TELE 3310, TELE 3350, 4380, 4390, MCOM 3300 and 3320. Also required are ECO 2305, PHIL 2320, and MATH 2300 or ISQS 2445.

Journalism Curriculum.

First Year	Second Year	Third Year	Fourth Year
News-Editorial Specialization			
MCOM 1300*	JOUR 3310, 3312	MCOM 3300, 3320	JOUR 4370, 4380
JOUR 2300	ECO 2305	PHOT 3310	JOUR 3350
PHIL 2320	MATH 2300 or ISQS 2445	Mass Comm. elect.	Mass Comm. elect.
Broadcast Specialization			
MCOM 1300*	JOUR 3310, 3312	JOUR 3314	JOUR 4370
JOUR 2300	TELE 3310 or JOUR 3350	MCOM 3300, 3320	TELE 4380, 4390
PHIL 2320	ECO 2305	TELE 3350	
	MATH 2300 or ISQS 2445	Mass Comm. elect.	

*Optional.

Advertising Major. Students majoring in advertising are required to complete 36-39 semester hours within the school, including the following courses: ADV 3310, 3351, 3361, 4312, 4316, JOUR 3309 or 3310, MCOM 3300, 3320.

Also required are ART 3350, ECO 2305, MATH 1330 and 1331, ISQS 2445, PHIL 2320, MKT 3350, and 3356.

Advertising Curriculum.

First Year	Second Year	Third Year	Fourth Year
MCOM 1300*	ISQS 2445	ADV 3351, 3361	ADV 4312, 4316
ART 3350	ADV 3310	MKT 3350, 3356	Mass Comm. elect.
ECO 2305	MCOM 3300	MCOM 3320	Mass Comm. elect.
MATH 1330, 1331	JOUR 3309 or 3310	Mass Comm. elect.	

*Optional.

Telecommunications Major. Students majoring in telecommunications are required to complete 36-39 semester hours within the school, including the following courses: TELE 3310, 3340, 3360 or 3370, 4320, MCOM 3300, 3320, JOUR 3309 or 3310, plus at least 9 hours must be taken from the telecommunications division courses. Three of the hours may be in photocommunications. The courses may be chosen from TELE 3100, 3320, 3330, 3350, 3380, 4300, 4330, 4360, 4380, 4390, or other departmental offerings following consultation.

Also required are ECO 2305, and MATH 2300 or ISQS 2445.

Corporate Telecommunications Sequence. Students in this sequence are enrolled as telecommunications majors and are required to complete 36-39 semester hours within the school, including the following courses: TELE 3310, 3360, 4360, PHOT 3310, MCOM 3300, and JOUR 3309 or 3310. Electives in the

school must be chosen from P R 3310, PHOT 3312, 4300, 4303, MCOM 1300, TELE 3100, 3320, 3330, 3390, 4300, 4330, 4390. Also required are ECO 2305, MATH 1330, and 1331, ISQS 2445, ISQS 2340 or EDIT 2318, MGT 3373, BLAW 3391, and ENGL 2309.

Students choosing this sequence are required to minor in business administration.

Telecommunications Curriculum.

First Year	Second Year	Third Year	Fourth Year
	Telecommunications		
MCOM 1300*	TELE 3310 JOUR 3309 or 3310 ECO 2305 MATH 2300 or ISQS 2445 Tele. elect.	TELE 3340 MCOM 3320 MCOM 3300 Mass Comm. elect. TELE 3360 or 3370	TELE 4320 Tele. elect. Tele. elect. Mass Comm. elect.
	Corporate Telecommunications Sequence		
MCOM 1300* MATH 1330, 1331 ECO 2305	TELE 3310 JOUR 3309 or 3310 ISQS 2445 ISQS 2340 or EDIT 2318 ENGL 2309	TELE 3360 PHOT 3310 BLAW 3391 MCOM 3300 Mass Comm. elect. Mass Comm. elect.	TELE 4360 MGT 3373 Mass Comm. elect. Mass Comm. elect.

*Optional

Photocommunications Major. Students majoring in photocommunications are required to complete 36-39 semester hours within the school, including the following courses: PHOT 3310, 3312, 3314, 4303, 4304, JOUR 3310, 3312, MCOM 3300 and 3320.

Also required are ART 1320, ECO 2305, and MATH 2300 or ISQS 2445.

Photocommunications Curriculum.

First Year	Second Year	Third Year	Fourth Year
ART 1320 ECO 2305	PHOT 3310, 3312 MATH 2300 or ISQS 2445 Mass Comm. elect.	PHOT 3314 MCOM 3300, 3320 JOUR 3310, 3312 Mass Comm. elect.	PHOT 4303, 4304 Mass Comm. elect.

Public Relations Major. Students majoring in public relations are required to complete 36-39 hours within the school, including the following courses: P R 3310, 3341, 4310, 4314, JOUR 3310, 3312, MCOM 3300, 3320, ADV 3310, and 9-12 hours from JOUR 3317, 4330, 4380, ADV 3351, 3361, TELE 3310, 3360, 4360, P R 3390, 4300, PHOT 3310.

Also required are ART 3350, ECO 2305, MATH 1330, 1331, ISQS 2445, ACCT 2300, MKT 3350, 3356, MGT 3370, COMS 3308, and PHIL 2320.

Public Relations Curriculum.

First Year	Second Year	Third Year	Fourth Year
ART 3350 ECO 2305 MATH 1330, 1331 PHIL 2320	ADV 3310 P R 3310 JOUR 3310 ACCT 2300 ISQS 2445 MCOM 3300	JOUR 3312 P R 3341 MCOM 3320 MKT 3350 COMS 3308 Mass Comm. elect.	MKT 3356 MGT 3370 P R 4310 P R 4314 Mass Comm. elect. Mass Comm. elect.

Teacher Education. In the teacher education program the school offers work in a teaching field in journalism for those planning careers in the secondary schools. A total of 27 hours is necessary to fulfill requirements with 21 hours in required courses plus 6 hours of electives from journalism courses.

The following courses constitute the required courses from the journalism secondary teaching field (Plan II): JOUR 2300, 3310, 3312, 3317, 3350, 4380, and PHOT 3310.

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, 3320, ADV 3310, TELE 3310, JOUR 3309, and 3 hours of electives from mass communications courses.

Journalism: JOUR 3310, 3312, 4370, 4380, and 6 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, 3370, 4320, and 6 hours of electives from telecommunications courses.

Photocommunications: PHOT 2300, 3310, 3312, 4300, 4303, and 4304.

Public Relations: JOUR 3309 (substitutes for JOUR 3310 and 3312 prerequisites for upper level public relations courses), ADV 3310, P R 3310, 3341, 4310 and 4314.

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.
- 3300. **Theories of Mass Communications (3:3:0).** 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.
- 3320. **Mass Communications Law (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.
- 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.
- 4380. **Mass Communications Survey and Research Methods (3:3:0).** Introduces the student to basic public opinion survey and research methodology and design. Historical and qualitative methods are included. Emphasis is on empirical research techniques and implementation.
- 4390. **Seminar in Mass Communications (3:3:0).** 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).** Prerequisite: Students must have a C or better in ENGL 1300 (if required), 1301, and 1302. Principles and practice of writing for major types of mass communications media. Credit will not be given for JOUR 3309 after completing JOUR 3310. For nonjournalism majors only. Typing 40 wpm required.
3310. **News Writing (3:2:3).** Prerequisite: Students must have a C or better in ENGL 1300 (if required), 1301, and 1302. The evaluation of news; news gathering methods and problems; discussion and exercises in writing leads, organizing stories, overcoming grammatical and structural problems; control lab. Typing 40 wpm required.
3312. **Reporting (3:2:3).** Prerequisite: JOUR 3310. Discussion and practice in interviewing, reporting, and writing 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).** Prerequisite: Typing 40 wpm required. 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.
3317. **Publication Design and Graphics (3:2:3).** Prerequisite: JOUR 3309 or 3310. Covers the contemporary design and production of mass media publications, emphasizing newspapers and magazines. Secondary emphasis on using a personal computer in typography, information graphics, and selection and editing of copy and art. Application of course content to the production of a student magazine.
3350. **History of American Journalism (3:3:0).** Study of the development of journalism in America from its European roots to the present and its interrelation with society.
3390. **Internship in Journalism (3).** Prerequisite: Junior or senior standing; JOUR 3310, 3312, plus recommendation of faculty member, division director and/or area coordinator. Minimum of eight weeks full-time supervised employment in media or communications organization. Weekly reports, interviews, and term paper approved by employer and intern director required. Must be taken pass-fail.
4300. **Individual Study in Journalism (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 4380 — 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.
4380. **Editing (3:2:3).** Prerequisite: JOUR 3310, 3312. Advanced 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 computers and desktop publishing.

Courses in Advertising. (ADV)

- 3310. Principles of Advertising (3:3:0).** 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.
- 3351. Advertising Media Planning (3:2:3).** Prerequisite: ADV 3310 or MKT 4354 and ISQS 2445 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, and ART 3350, or consent of instructor. Must be taken after or concurrently with ADV 3351 or P R 3341. 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.
- 3390. Internship in Advertising (3).** Prerequisite: Junior or senior standing; ADV 3310, 3351, or 3361, plus recommendation of faculty member, division director, and/or area coordinator. Minimum of eight weeks full-time supervised employment in media or communications organization. Weekly reports, interviews, and term paper approved by employer and intern director required. Must be taken pass-fail.
- 4300. Individual Study in Advertising (3).** Prerequisite: Senior standing, 9 hours of advertising 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 3351 and 3361, 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.
- 4316. Advertising Administration (3:3:0).** Prerequisite: Completion of all required courses (must be taken during the final 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: Consent of instructor. Laboratory in radio-television activities; limited to 3 hours for majors and minors; 1 hour for others. Must be taken pass-fail.
- 3310. Introduction to Telecommunications (3:3:0).** 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 experience in the direction and production of radio broadcast materials.

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 and MATH 2300 or ISQS 2445. 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 JOUR 3350 and JOUR 3314. A concentrated course in the theory and practice of news presentation and the responsibilities and opportunities of the news anchor and news reporter.
3360. **Writing for Corporate Media (3:2:4).** Prerequisite: Consent of instructor. Development of principles and practice in writing for corporate 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 broadcast media including KTXT-FM.
3380. **Radio and Television Advertising (3:2:3).** Prerequisite: ADV 3351 or TELE 3340. 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 broadcast advertising budgets, campaigns, and schedules using personal computers.
3390. **Internship in Telecommunications (3).** Prerequisite: junior or senior standing; TELE 3310, 3320 for radio; TELE 3310, 3330 for television; TELE 3310, 3360 for corporate telecommunications, plus recommendation of faculty member, division director and/or area coordinator. Minimum of eight weeks full-time supervised employment in media or communications organization. Weekly reports, interviews, and term paper approved by employer and intern director required. Must be taken pass-fail.
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: TELE 3340 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. **Corporate Telecommunications (3:2:4).** Telecommunications systems used by industry, business, medicine, education, and the military. Emphasis on video software development and trends in corporate 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 and post-production activities from research to final video editing.
4390. **Telecommunications Practicum (3).** Prerequisite: TELE 3310, 3320, 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)

- 2300. Photographic Vision and the Mass Media (3:3:0).** Introduction to photographic equipment and materials and the study of visual images in mass media. Principles of using cameras and the study of aesthetics and ethics of visual communication. Non-laboratory slide projects will require access to at least a simple camera.
- 3310. Basic Photography (3:2:4).** Prerequisite: At least a 2.00 overall GPA. 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 must have access to a camera with manual controls.
- 3312. Intermediate Photography (3:2:4).** Prerequisite: PHOT 3310. A detailed study of the materials and processes of photography. Emphasis on print and negative quality, composition, and elements of good photography.
- 3314. Photojournalism (3:2:4).** Prerequisite: PHOT 3312. The history of photojournalism and its legal and ethical issues. Laboratory work will include different forms of editorial and newspaper photography.
- 3390. Internship in Photocommunications (3:3:0).** Prerequisite: PHOT 3310, 3312, and 3314. Professional work in mass media. Supervised work in media or communications organizations. Minimum of 8 weeks full-time employment. Required weekly reports and term paper approved by employer and intern director. Must be taken pass-fail.
- 4300. Special Problems in Photography (3).** Prerequisite: PHOT 3312 or consent of instructor. Individual investigation into the areas of documentary news, photography, or advertising. May be repeated for credit.
- 4303. Color Photography (3:2:4).** Prerequisite: PHOT 3312. The theory of color negative film, transparencies, printing, filtration, and analysis will be covered. Laboratory work will include a working knowledge of color printing, negative and transparency film processing.
- 4304. Senior Portfolio in Photocommunications (3:2:4).** Prerequisite: PHOT 4303. A detailed study of photography with emphasis on print and negative quality, composition, use of color, and elements of good photography. A major project resulting in a finished portfolio will be required.

Courses in Public Relations. (P R)

- 3310. Principles of Public Relations (3:3:0).** 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.
- 3341. Public Relations Media (3:2:3).** Prerequisite: P R 3310, ADV 3310, JOUR 3310 and 3312. A study of the various avenues of communication available to public relations practitioners. Includes experience in producing the wide variety of communication vehicles employed by contemporary organizations.
- 3390. Internship in Public Relations (3).** Prerequisite: junior or senior standing; P R 3310, 3341, plus recommendation of faculty member, division director, and/or area coordinator. Minimum of eight weeks full-time supervised employment in media or communications organization. Weekly reports, interviews, and term paper approved by employer and intern director required. Must be taken pass-fail.
- 4300. Individual Study in Public Relations (3).** Prerequisite: Senior standing, 9 hours of public relations courses, and consent of instructor prior to registration.
- 4310. Public Relations Administration (3:3:0).** Prerequisite: P R 3310, 3341, and JOUR 3312. A course emphasizing the methods and techniques of public relations communication and problem solving.
- 1314. Public Relations Cases and Problems (3:3:0).** Prerequisite: Completion of all 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 organizations. Emphasis on contemporary problems in public relations.

Department of Mathematics

Professor Ronald M. Anderson, Chairperson; Professor Thomas G. McLaughlin, Associate Chairperson; Associate Professor Robert Byerly, Assistant Chairperson. ESA Distinguished Professor Martin; Professors Barnard, Bennett, Chanda, Duran, Ford, Gilliam, Gustafson, Hildebrand, T. Lewis, W. Lewis, Newman, Ruymgaart, Strauss, Tarwater, Victory, and Walling; Associate Professors Drager, Gangopadhyay, Harris, Kellogg, Miller, Mitra, Moreland, Pearce, Schovanec, Weinberg, and White; Assistant Professors E. Allen, L. Allen, Cordero-Vourtsanis, Kennedy, Lee, Lejarraga, Mansouri, Mohamad, M. Shubov, V. Shubov, Stromberg, Tse, Vourtsanis, Yang, and Zack; Visiting Assistant Professor Wang.

This department supervises the following degree programs: MATH-EMATICS, *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.

Flexibility of elective courses in mathematics is designed to allow the student to prepare to enter the industrial job market, to enter graduate school or professional school, or to begin a teaching career. Recent Tech mathematics graduates have been employed by companies in aerospace (N.A.S.A., defense), electronics (computers, telecommunications), finance (banks, brokerage, insurance), government (federal agencies, offices, laboratories), petroleum (geophysical, oil), and transportation (airlines, trucking). Some graduates have entered law school or medical school, while many have pursued graduate degrees at various universities.

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 two 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. MATH 3330 and MATH 4330 are recommended elective courses.

For a major in mathematics, a student must have a grade of C or better in each mathematics 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 29 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 the 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. The minor sequence is MATH 1351, 1352, 2350, and 2360 plus 6 semester hours of approved courses at the 3000-level or above. 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. The student preparing to teach in the elementary school may select mathematics as an area of academic specialization 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 or secondary education certification.

The courses offered in mathematics for students intending to prepare themselves for elementary teaching are MATH 1320, 2370, 2371, 3370, 3371, 4370, and 4371.

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, 4331 and 4342;
- (2) 6 additional hours to be chosen from MATH 3360, 4330, 4350, 4362.

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 (ACTM) scores.

The following list describes the mathematics courses most frequently taken by freshmen:

- (1) MATH 0301 and 0302 are remedial courses and do not carry degree credit. MATH 0301 and 0302 have no prerequisites.
- (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, SATM of at least 450, or ACTM of at least 18.
MATH 1321 Prerequisites: reasonable proficiency in algebra and geometry, SATM of at least 450, or ACTM of at least 18.
- (3) MATH 1330 and 1331 are designed for students of business and other selected areas.
MATH 1330 Prerequisites: 4 semesters of high school algebra, SATM of at least 450, or ACTM of at least 18.
- (4) MATH 1350, 1351, and 1352 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 550 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 580 or better on the SATM.

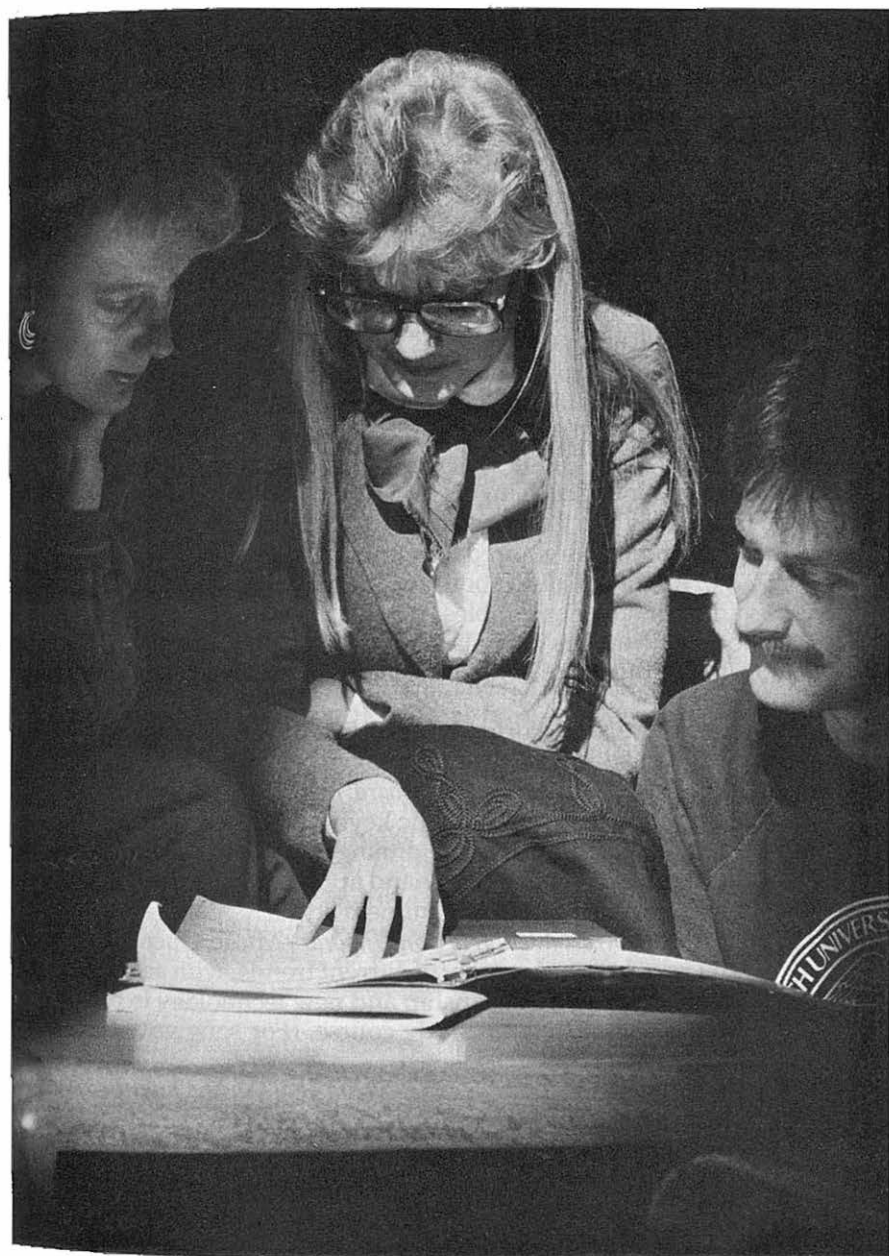
- (5) **MATH 1371** is designed only for students in elementary education and will not meet the mathematics requirements for other majors.

Courses in Mathematics. (MATH)

- 0301. Essential Mathematics (3:3:0).** A remedial course for students with weak preparation in fundamental mathematics and geometry. Not applicable toward degree requirements in any program of the University. Hours in MATH 0301 are in addition to the minimum number needed for graduation.
- 0302. Intermediate Algebra (3:3:0).** This intermediate algebra course is designed for students with weak mathematical preparation. Not applicable toward general degree requirement in any degree program in the University. Hours in MATH 0302 are in addition to the minimum number needed for graduation.
- 1320. College Algebra (3:3:0).** Prerequisite: Reasonable training in high school algebra and geometry, SATM of 450 or B or better in 0302. 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. MATH 1330 contains set theory; inequalities; equations, relations; functions; vectors; matrices; linear programming; probability; progressions; mathematics of finance. MATH 1331 contains differential, integral, and multivariable calculus.
- 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.
- 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 580 or better on the MAT. Differentiation of algebraic functions, applications of the derivative, differentials, indefinite integrals, definite integrals. (Honors section offered.)
- 1352. Calculus II (3:3:0).** Prerequisite: MATH 1351 or consent. Methods of integration, parametric equations, polar coordinates, hyperbolic functions, applications. (Honors section offered.)
- 1371. Fundamental Structure of Arithmetic for Elementary Teachers II (3:3:0).** Fundamental operations and concepts of arithmetic; systems of numeration; relations and functions; measurements. May not be applied toward any Arts and Sciences degree.
- 1551. Analytical Geometry and Calculus I (5:5:0).** Prerequisite: Satisfactory placement test scores and knowledge of basic trigonometry or MATH 1320 and 1321. 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. Elementary Analysis I (3:3:0).** Prerequisite: MATH 1320, 1330, or 1321. Trigonometry and analytic geometry with applications. Not for engineering, science, or mathematics majors.
- 2371. Elementary Analysis II (3:3:0).** Prerequisite: MATH 1350 or 2370. Elementary differential and integral calculus with application. Not for engineering, science, or mathematics majors.
- 3322. Higher Mathematics for Engineering Technology (3:3:0).** Prerequisite: MATH 2350. Topics include differential equations, Laplace transform, Fourier series, and vector and matrix algebra.
- 3330. Computational Techniques for Science and Mathematics (3:3:0).** Prerequisite: MATH 1352. Emphasis on scientific computing and problem solving techniques.
- 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. Elementary Geometry (3:3:0).** Prerequisite: MATH 1331, 1351, or 2371. Congruence and measures of plane and solid figures; similarity; areas; volumes. Not for engineering, science, or mathematics majors.
- 3371. Elements of Finite Mathematics (3:3:0).** Combinatorics, probability theory, Bayes' Theorem, Bernoulli Trials. Probability distributions and statistics. Not for engineering, science, or mathematics majors.
- 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.
- 4330. Mathematical Computing (3:3:0).** Prerequisite: MATH 1352. Topics from computer literacy and programming.
- 4331. Advanced Geometry (3:3:0).** Prerequisite: MATH 2350 and 2360. Euclidean and projective geometries.
- 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 2360 (MATH 3360 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 2360. 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 2360. Prime numbers; congruences; theorems of Fermat, Euler, and Wilson; residues; reciprocity law; Diophantine Equations.
- 4370. Elementary Problem Solving (3:3:0).** Prerequisite: MATH 2371, 3371, or equivalent. Techniques of problem solving using elementary number theory.
- 4371. Basic Computer Literacy and Programming (3:3:0).** Prerequisite: MATH 4370. Computer literacy, structured programming, and problem solving using elementary number theory.
- 4399. Selected Topics (3).** Prerequisite: Consent of undergraduate program director. Selected topics in upper division mathematics. May be repeated for credit.



School of Music

Professor Wayne C. Hobbs, Director.

Horn Professors J. Gillas and van Appledorn; Professors G. Barber, J. Barber, Bogle, Brittin, Cutter, R. Deahl, Kellogg, Maynard, Stoune, Sudduth, R. Tolley, and Westney; Associate Professors Arnold, Bearden, Davis, L. Deahl, Follows, Gettel-Pearson, Glaser, Hartwell, McGowan, Meek, Paxton, Payne, Schoenfeld, Shin, Shinn, Tanner, Thomas, Turner, Vaughan, and Wilson; Assistant Professors Henry, Redinger, Von Freid, and Walzel; Lecturers M. Gillas, M. Redcay, and Van Ness; Visiting Associate Professor Hagberg; Visiting Assistant Professors Hagemeyer, Matthews, and Shambley.

The school 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 (with Teacher Certification)*, *Master of Music Education*; FINE ARTS, *Doctor of Philosophy* with an option in Music. The school 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); University Choir (M EN 3101, 3201); University Singers, Collegiate Singers (M EN 3101); Music Theatre (M EN 3102, 3202); Jazz Ensembles and Combos (M EN 3105); and Instrumental Ensembles (M EN 3106). Auditions are required for some of these ensembles; check with the 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, music composition, music literature, and music theory with the consent of the instructor.

Although nonmusic majors may enroll in any music course, the following courses are designed specifically for nonmajors.

MAP 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. *Introduction to Contemporary Music*. Open to both majors and nonmajors. A survey of current trends, with activities emphasizing creative musicianship and new technology in composition. May be an individual study course. (For songwriting, see M TH 1300.)

MCP 3001. *Projects in Electronic and Experimental Music*. Open to both majors and nonmajors. Prerequisite: M CP 1202, or the equivalent, and instructor approval. Independent study and creative projects utilizing the resources of the Experimental Music Studio. May be repeated for credit.

- M CP 3303. *Principles of Composition*. Prerequisite: M CP 1202, or the equivalent, and instructor approval. Creative work for students not majoring in composition. May be an individual study course and may be repeated for credit.
- MLT 1308. *Music Appreciation*. Beginning course for nonmajors. Appreciation of music is encouraged through consideration of a variety of musical styles. Satisfies humanities requirement.
- MLT 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.
- MLT 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.
- MLT 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 1300. *Songwriting*. A beginning course for non-music majors. A practical approach to music theory through songwriting. Includes aural training, notation, textual setting, melodic writing, and chord assignment.
- M TH 1301. *Introduction to Music Theory*. Open to both majors and nonmajors. An introduction to the elements of melody, rhythm, and harmony, plus developmental skills in sight-singing and dictation.

Music Programs. Curricula for all music major programs are under revision to incorporate General Education requirements. Performance degrees include majors in piano (pedagogy or accompanying specializations are also available), organ, voice, brass, woodwind, and percussion instruments, and stringed instruments. Majors are also offered in music composition, music history and literature, and music theory. The Bachelor of Music (with Teacher Certification) degree will replace the degree formerly known as the Bachelor of Music Education. Please consult an advisor in the School of Music for these curricula. Minors in music are available in a variety of programs ranging from 18 to 24 semester hours; information is available in the School of Music office.

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 School of Music. 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 School 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 during each semester of freshmen-sophomore theory to qualify for advancement.

All students whose principal instrument is not keyboard must demonstrate piano proficiency as determined by the School.

All students enrolled in keyboard must have practical experience in accompanying as designated by the School 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 majors seeking teacher certification must participate in chorus for eight semesters. All wind and percussion music majors seeking teacher certification must participate in marching band for four semesters and concert band for four 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 majors seeking teacher certification 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 majors seeking teacher certification 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 with teacher certification, music history and literature, or performance degrees are required to present a 1/2 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 3/4 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 attend at least twelve weekly student recitals and at least twelve additional approved concerts or recitals per semester for six semesters and must enroll for MUS 2101, Music in Performance, at least once.

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 applicable only to students who entered as freshmen prior to fall 1989. The tables are provided as a convenience to students and advisors. At press time, the curricula are undergoing revision to incorporate elements of the General Education curriculum. 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**

<i>Fall</i>		<i>Spring</i>	
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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	M EN 3106-1, Accompanying	1
M EN 3106-1, Accompanying	1	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	<u>1</u>		<u>17</u>
	18		

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
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
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	<u>1</u>	M EN 3106-1, Accompanying	<u>1</u>
	16		16

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
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 AP 3206, Conducting	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	<u>1</u>	M EN 3106-1, Accompanying	<u>1</u>
	16		17

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
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 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
M EN 3106-1, Accompanying	<u>1</u>	M EN 3106-1, Accompanying	<u>1</u>
	13-14		14

*Program shown is for performance majors. Pedagogy or accompanying specialization students should consult the chairperson of keyboard studies.

**COMS 1301 may be substituted.

Performance—Organ Curriculum.**FIRST YEAR**

<i>Fall</i>		<i>Spring</i>	
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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	Ensemble	1
Ensemble	1	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	<u>1</u>		<u>17</u>
	18		

<i>Fall</i>	
M AP 2001, Organ	4
M TH 2403, Intermed. Theory	4
ENGL 2301, Mast. of Lit.	3
M LT 2301, Hist. of Music	3
Ensemble	1
	<hr/> 15

<i>Fall</i>	
M AP 3001, Organ	4
M AP 3203, Church Serv. Playing	2
M TH 3303, Form, Anal. & Synth.	3
M AP 3206, Conducting	2
American History	3
Elective	3
Ensemble	1
	<hr/> 18

<i>Fall</i>	
M AP 4001, Organ	4
M TH 4305, Counterpoint	3
POLS 1301, Amer. Govt., Org.	3
Music elective	3
M EN 3106-1, Accompanying	1
Ensemble	1
	<hr/> 15

*COMS 1301 may be substituted.

Performance-Voice Curriculum.

<i>Fall</i>	
M AP 1001, Voice	2
Applied Music (piano)	1
M LT 1301, Intro. Music Lit.	3
M TH 1403, El. Theory	4
ENGL 1301, Ess. Coll. Rhetoric	3
FREN 1401 or GERM 1401 or ITAL 1301	3-4
Ensemble	1-2
MUS 2101, Music in Performance	1
Dance or Fencing	1
	<hr/> 19-21

<i>Fall</i>	
M AP 2001, Voice	3
M LT 2301, Hist. of Music	3
M TH 2403, Intermed. Theory	4
ENGL 2301, Mast. of Lit.	3
Foreign Language	3-4
Ensemble	1-2
	<hr/> 17-19

<i>Fall</i>	
M AP 3001, Voice	4
M AP 3303, Vocal Literature	3
M TH 3303, Form, Analysis, Syn.	3
American History	3
Foreign Language	3
Ensemble	1-3
	<hr/> 17-19

SECOND YEAR

<i>Spring</i>	
M AP 2002, Organ	4
M TH 2404, Intermed. Theory	4
ENGL 2302, Mast. of Lit.*	3
M LT 2302, Hist. of Music	3
Ensemble	1
	<hr/> 15

THIRD YEAR

<i>Spring</i>	
M AP 3002, Organ	4
Mus. Theory or Mus. Lit. elective	2
M AP 3208, Instrumental Cond.	3
American History	2
Elective	3
Ensemble	3
	<hr/> 18

FOURTH YEAR

<i>Spring</i>	
M AP 4002, Organ	4
Mus. Theory or Mus. Lit. elective	2
POLS 2302, Amer. Pub. Pol.	3
Music elective	3
M EN 3106-1, Accompanying	1
Ensemble	1
	<hr/> 15

FIRST YEAR

<i>Spring</i>	
M AP 1002, Voice	2
Applied Music (piano)*	1
M LT 1302, Intro. Music Lit.	3
M TH 1404, El. Theory	4
ENGL 1302, Adv. Coll. Rhetoric	3
FREN 1401 or GERM 1401 or ITAL 1301	3-4
Ensemble	1-2
Dance or Fencing	1
	<hr/> 19-21

SECOND YEAR

<i>Spring</i>	
M AP 2002, Voice	3
M LT 2302, Hist. of Music	3
M TH 2404, Intermed. Theory	4
ENGL 2302, Mast. of Lit.**	3
Foreign Language	3-4
Ensemble	1-2
	<hr/> 17-19

THIRD YEAR

<i>Spring</i>	
M AP 3002, Voice	4
TH A 2302, Prin. of Acting	3
American History	3
Foreign Language	3
Ensemble	3
	<hr/> 17-19

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
M AP 4001, Voice	4	M AP 4002, Voice	4
M AP 3206, Conducting	2	M AP 4305, Vocal Pedagogy	3
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Public Pol.	3
Elective***	6	Elective***	3
Ensemble	2-4	Ensemble	2-4
	17-19		15-17

*Must pass proficiency level equivalent M AP 2124.

**COMS 1301 may be substituted.

***Recommended electives include TH A 3302 and a third year of the same foreign language.

Performance—Wind Instrument or Percussion Curriculum.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	*Ensemble	1-2
*Ensemble	1-2	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	1		17-18
	18-19		

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
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
ENGL 2301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.**	3
*Ensemble	1-2	*Ensemble	1-2
	16-17		16-17

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
M AP 3001, Major Instr.	4	M AP 3002, Major Instr.	4
M TH 3303, Form, Anal. & Syn.	3	M AP 3206, Conducting	2
American History	3	Mus. Theory or Mus. Lit. elective	3
Elective	3	American History	3
*Ensemble	1-2	Elective	3
	14-15	*Ensemble	1-2
			16-17

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
M AP 4001, Major Instr.	4	M AP 4002, Major Instr.	4
POLS 1301, 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.

**COMS 1301 may be substituted.

Performance—Stringed Instrument Curriculum.

FIRST YEAR			
<i>Fall</i>		<i>Spring</i>	
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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	M EN 3104 or 3204, Orch.	1
***M EN 3104 or 3204, Orch.	1	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	1		1
	<u>18</u>		<u>17</u>
SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
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
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 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		1
	<u>19-20</u>		<u>17-18</u>
THIRD YEAR			
<i>Fall</i>		<i>Spring</i>	
M AP 3001, Major Instrument	4	M AP 3002, Major Instr.	4
M TH 3303, Form, Anal. & Syn.	3	M AP 3206, Conducting	2
American History	3	Mus. Theory or Mus. Lit. elective	3
Elective	3	American History	3
M EN 3104 or 3204, Orch.	1-2	Elective	3
M EN 3106-2, Chamber Music	1	M EN 3104 or 3204, Orch.	1-2
	<u>15-16</u>	M EN 3106-2, Chamber Music	1
			<u>12-13</u>
FOURTH YEAR			
<i>Fall</i>		<i>Spring</i>	
M AP 4001, Major Instr.	4	M AP 4002, Major Instr.	4
M TH 4305, Modal Counterpoint		M TH 4207, Instrumentation	2
or M TH 4307, Counterpoint		POLS 2302, Amer. Pub. Pol.	3
and Fugue	3	Elective	3
POLS 1301, Amer. Govt., Org.	3	M EN 3104 or 3204, Orch.	1-2
Elective	3	M EN 3106-2, Chamber Music	1
M EN 3104 or 3204, Orch.	1-2		1
M EN 3106-2, Chamber Music	1		<u>14-15</u>
	<u>15-16</u>		

*Violin students must elect M AP 2001 (viola); viola students must elect M AP 2001 (violin). (Does not apply to guitar students.)

**COMS 1301 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

<i>Fall</i>		<i>Spring</i>	
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, Intro. Contemp. Mus.	2	M CP 1202, Intro. Contemp. Mus.	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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	Ensemble	1
Ensemble	1	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	1		17
	18		

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
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
ENGL 2301, Mast. of Lit.	3	ENGL 2302, Mast. of Lit.**	3
Ensemble	1	Ensemble	1
	18		18

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
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 3308, 20th Cent. Tech.	3
M TH 4207, Instrumentation	2	M TH 4208, Orchestration	2
American History	3	American History	3
Ensemble	1	Ensemble	1
	15		15

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
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 AP 3206, Conducting	2	POLS 2302, Amer. Pub. Pol.	3
POLS 1301, 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.

**COMS 1301 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			
<i>Fall</i>		<i>Spring</i>	
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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	American History	3
American History	3	Ensemble	1-2
Ensemble	1-2	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	1		18-19
	19-20		

SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
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
ENGL 2301, Mast. of Lit.	3	**ENGL 2302, Mast. of Lit.	3
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
Ensemble	1-2	Ensemble	1-2
	17-18		17-18

THIRD YEAR			
<i>Fall</i>		<i>Spring</i>	
M AP 3001, Prin. Instr.	2	M AP 3002, Prin. Instr.	2
†Music Literature	3	M TH 3308, 20th Cent. Tech.	3
M TH 3303, Form, Anal. & Syn.	3	Foreign Language	4
Foreign Language (German or French recommended)	4	Elective	3
Ensemble	1-2	Ensemble	1-2
Elective	3		13-14
	16-17		

FOURTH YEAR			
<i>Fall</i>		<i>Spring</i>	
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	1-2	Ensemble	1-2
†Music Literature	3	Elective	6
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.

**COMS 1301 may be substituted.

†Select from M LT 4312, 4313, 4314, 4315, 4316, M AP 4301, 4302.

Music Theory Curriculum.

FIRST YEAR			
<i>Fall</i>		<i>Spring</i>	
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	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	Foreign Lang. (Fr., Germ., Ital.)	4
Foreign Lang. (Fr., Germ., Ital.)	4	Ensemble	1
Ensemble	1	P.E., Band, ROTC, or Nutr.	1
P.E., Band, ROTC, or Nutr.	1		18
	20		

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
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
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
	<u>17</u>		<u>17</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
M AP 3001, Prin. Instr.	2	M AP 3002, Prin. Instr.	2
M TH 3303, Form, Anal. & Syn.	3	M TH 3308, 20th Cent. Tech.	3
M AP 3206, Conducting	2	M AP 3208, Instr. Cond.	2
M TH 4305, Modal Counterpoint	3	M TH 4307, Tonal Cpt. & Fugue	3
American History	3	American History	3
Ensemble	1	Ensemble	1
Music elective	2-3	Music elective	2-3
	<u>16-17</u>		<u>16-17</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
M AP 4001, Prin. Instr.	2	M AP 4002, Prin. Instr.	2
POLS 1301, 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
	<u>17</u>		<u>17</u>

*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.

**COMS 1301 may be substituted.

Courses in Music. (MUS)

2000. **Independent Studies in Music (V1-3).** Individual study at the freshman and sophomore levels, providing greater depth than required by the established curricula. Enrollment and credit hours subject to the approval of divisional coordinators.
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.
2301. **Essential Elements of Music (3:3:0).** Basic elements of music with appropriate techniques and principles of singing, playing, moving to, and listening to music. *Not for music majors.*
- 3201, 3202. **Music for the Adolescent (2 each).** Content, organization, and administration of large and small instrumental and choral ensembles, programs of individual applied music, and appreciation of music for the adolescent.
- 3216, 3217. **Choral Techniques (2 each).** Materials, repertoire, and procedures for preparing choral performances.
- 3218, 3219. **String and Orchestral Techniques (2 each).** Materials, repertoire, and procedures for preparing orchestral and string ensemble performances.
- 3221, 3222. **Music Literature for Children (2 each).** Techniques for listening to music with particular emphasis upon styles and form through appropriate masterworks. *Not for music majors.*

- 3224. Jazz Ensemble Techniques (2).** Materials, repertoire, and procedures for preparing jazz ensemble performances.
- 3225, 3226. Band Techniques (2 each).** Materials, repertoire, and procedures for preparing band performances.
- 3330. Music Theory for Children (3).** Prerequisite: MUS 2301. Harmonic and melodic concepts derived from creative activities appropriate for children. *Not for music majors.*
- 3336. Music for Young Children (3:3:0).** Music activities as an enhancement to the intellectual, emotional, aesthetic, and social growth of young children (ages 3-8). *Not for music majors.*
- 3337, 3338. Music for Children (3 each).** A study of musical activities, materials, and creative ideas. Emphasis on developing the child's voice, movement, playing simple melodic and harmonic instruments, and listening skills.
- 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, Guitar, Harp, Harpsichord, Horn, 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. Enrollment limited to piano majors, or by instructor consent.
- 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.
- 3205. Jazz Improvisation (2).** Prerequisite: Consent of instructor. Study and application of techniques of improvisation in jazz performance. May be repeated for credit.
- 3206. Conducting (2:2:0).** Basic conducting techniques.
- 3207. Choral Conducting (2).** Prerequisite: M AP 3206. Specific techniques of choral conducting and choral rehearsal.
- 3208. Instrumental Conducting (2).** Prerequisite: M AP 3206. Advanced baton techniques, score reading, and interpretation.
- 3303. Vocal Literature (3).** Prerequisite: MLT 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.
- 4301, 4302. **Keyboard Literature I and II (3 each)**. A survey of keyboard literature from earliest times to the present. Class performance and listening.
- 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.
4307. **Choral Conducting (3)**. Prerequisite: M AP 3207. 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 AP 3208. Study and performance of instrumental works of all periods. Participation in a major instrumental ensemble required. An individual study course.
- Applied Music 1001, 1002, 2001, 2002, 3001, 3002. **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. **Introduction to Contemporary Music (2 each)**. *Open to both majors and nonmajors*. A survey of current trends, with activities emphasizing creative musicianship and new technology in composition. May be an individual study course. (For songwriting, see M TH 1300.)
- 2401, 2402. **Music Composition (4 each)**. *For composition majors*. Prerequisite: M CP 1202 or the equivalent. Work in traditional forms and media and also electronic media, together with the principles of notation, layout, reproduction, and copyright. May be an individual study course.
3001. **Projects in Electronic and Experimental Music (V2-4)**. *Open to both majors and nonmajors*. Prerequisite: M CP 1202, or the equivalent, and instructor approval. Independent study and creative projects utilizing the resources of the Experimental Music Studio. May be repeated for credit.
3303. **Principles of Composition (3)**. Prerequisite: M CP 1202, or the equivalent, and instructor approval. Creative work for students not majoring in composition. May be an individual study course and may be repeated for credit.
- 3401, 3402. **Music Composition (4 each)**. *For composition majors*. Prerequisite: M CP 2402 and formal approval to continue in the Bachelor of Music program in Music Composition. Continued work in both traditional and electronic media. May be an individual study course.
- 4401, 4402. **Music Composition (4 each)**. *For composition majors*. Prerequisite: M CP 3402 or the equivalent. Advanced work on a larger scale, culminating in a senior recital as noted in the curriculum. May be an individual study course.

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).
 3107. New Music Ensemble (1:0:3).
 3201. University 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). *For music majors or with consent of instructor.* 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.
- 2301, 2302. History of Music (3:3:0 each). *For music majors or with consent of instructor.* Prerequisite: M LT 1301, 1302. Historical survey of the music of Western civilization from ancient times to the present. Either course may be taken first.
- 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.
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.
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 MUS 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.
4312. Music of the Renaissance Period (3:3:0). Prerequisite: M LT 2301, 2302. A survey of music from c.1450 to c.1600.
4313. Music of the Baroque Period (3:3:0). Prerequisite: M LT 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 2301, 2302. A survey of music from c.1825 to c.1900.
4316. Music of the Twentieth Century (3:3:0). Prerequisite: M LT 301, 1302 and 2301, 2302. A study of trends and developments in music since 1900.

Courses in Music Theory. (M TH)

1300. Songwriting (3:3:0). A beginning course *for nonmusic majors.* A practical approach to music theory through songwriting. Includes aural training, notation, textual setting, melodic writing, and chord assignment.
1301. Introduction to Music Theory (3:3:0). *Open to both majors and nonmajors.* An introduction to the elements of melody, rhythm, and harmony, plus developmental skills in sight-singing and dictation.
- 1403, 1404. Elementary Theory (4:3:2 each). Melody, rhythm, and diatonic harmony in four voices, together with dictation, sight-singing, and keyboard skills.
- 2403, 2404. Intermediate Theory (4:3:2 each). Prerequisite: M TH 1404 or equivalent. Analysis, written work, dictation, keyboard skills, and sight-singing. Included are diatonic and chromatic harmony in four voices and also small contrapuntal forms.

3303. **Form, Analysis, and Synthesis (3:3:0).** Prerequisite: M TH 2404 or the equivalent. The analysis and synthesis of Classical, Romantic, Impressionist, and Contemporary styles, including harmonic and nonharmonic practices and the principles of both small and large part-forms. May be an individual study course.
3308. **Twentieth Century Techniques (3:3:0).** Prerequisite: M TH 3303 or the equivalent. The study of contemporary techniques, modes, synthetic scales, serialism, and vertical structures—with syntheses and a term project.
4207. **Instrumentation (2:2:0).** Prerequisite: M TH 2404 or equivalent. A study of the properties of wood wind, brass, percussion, and string instruments, their transpositions, and their sectional treatment, leading to full scorings for both band and orchestra.
4208. **Orchestration (2).** Prerequisite: M TH 4207. More advanced work in scoring for both band and orchestra.
- 4302, 4303. **Fundamentals of Composition (3 each).** Prerequisite: M TH 3303. Original writing in small forms for voice, solo instruments, and small ensembles; the development of individual style. An individual study course.
4305. **Modal Counterpoint (3).** Prerequisite: M TH 2404 or equivalent. A study of sixteenth-century vocal counterpoint, beginning with the principles of melodic writing and concentrating upon the analysis and synthesis of polyphonic textures, as found in the motet and the Mass.
4307. **Tonal Counterpoint and Fugue (3).** Prerequisite: M TH 2404 or equivalent. The analysis and synthesis of eighteenth-century counterpoint in two to four voices, concentrating upon the instrumental style and techniques of the invention and the fugue.
4309. **Arranging (3).** Prerequisite: M TH 4207 or the equivalent. Techniques of arranging for concert band, marching band, and jazz ensembles; with laboratory performances. An individual study course.

Department of Philosophy

Associate Professor Daniel O. Nathan, Chairperson.

Peirce Professor Ketner; Associate Professors Averill, Jobe, and Ransdell; Assistant Professors Curzer and Schaller.

This department supervises the following degree programs: PHILOSOPHY, *Bachelor of Arts*, *Master of Arts*. The department also participates in directing the minor in humanities at the undergraduate level and the doctoral program in fine arts at the graduate level.

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 students of philosophy are able to think for themselves in a critical and objective manner.

Evidence that a philosophy education has broad application to various fields can be seen in the remarkable performance of majors on admission to professional schools. Over recent years, they have scored higher than all but economics majors on admissions tests to business schools (GMAT), higher than any other humanities or social science areas on the graduate record examina-

tions (GRE), and third of all disciplines on the law school admission test (LSAT). Additionally, philosophy majors have been more likely than almost all other majors to gain admission to medical schools. No other undergraduate discipline can match such a record of achievement across the entire range of professional schools.

The Philosophy Department twice yearly brings distinguished guest speakers from around the world for public lectures, classroom discussions, and visits with philosophy majors and graduate students. These visits provide a unique chance to talk informally about philosophical topics with world famous scholars.

Students majoring in philosophy must complete 30 hours in philosophy, including PHIL 2310, 3301, 3303, either 4330 or 4340, and one of the following: 2320, 3320, 3321, or 4320. Majors may not count PHIL 1310 toward fulfilling the 30 hour requirement, but they may substitute PHIL 4310 for the 2310 requirement. 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, and Dewey.
- 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.
3323. **Business Ethics (3:3:0).** Discussion of the conceptual and moral issues arising from the practices and institutions of business.
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 including the 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).** Prerequisite: Consent of instructor. 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 within the arts.
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).
4341. **Great Figures in Philosophy (3:3:0).** In-depth study of the works of just one or two great philosophers.

Department of Physics

Professor Walter L. Borst, Chairperson.

Professors Hatfield, Kim, Lodhi, Menzel, Mires, Myles, and Quade; Associate Professors Lichti and Peters; Assistant Professors Cheng, Estreicher, Gangopadhyay, Gibson, Glab, and Lamp; Joint Professors Ishihara, Kristiansen, Portnoy, and Quiterus; Adjunct Professors Agarwal, Guenther, Sadler, and Scully; Emeritus Professors DasGupta, Gott, Sandlin, and Thomas.

This department supervises the following degree programs: PHYSICS, *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 the College of Engineering.

A typical sequence of courses in physics begins with: PHYS 1308 and 1106, 2301 and 1106, and 2402, for a total of 12 hours at the introductory level. These are followed by the intermediate sequence: PHYS 3204 (2 semesters), 3301, 3305, 4302, 4304, and 4307, for a total of 19 hours. The final sequence is: one of 3306 or 4305, and two advanced topics for a total of 40 hours. The advanced topics offered are: Computational Physics (4301), Solid State Physics (4309), Atomic and Molecular Physics (4310), and Nuclear and Particle Physics (4312). Students who intend to pursue graduate work in physics should take both 3306 and 4305; also, all four advanced topics are highly recommended.

The required mathematics courses for physics majors are MATH 1350, 1351, 1352, 2350, 3350, and 3351. Students planning to pursue graduate work in physics are also encouraged to take mathematics courses such as MATH 4350, 4351, and 4356.

In fulfilling degree requirements, majors in this department must have a grade-point average of 2.00 or higher in physics courses, with at least 40 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).

Students are encouraged to devote time to undergraduate research, both experimental and theoretical. Research in the department includes atomic, molecular, and optical physics, condensed matter physics, nuclear physics, biophysics, lasers, and nonlinear systems. Applied physics is pursued in fluorescence spectroscopy, forensic studies, pulse power, materials, and surfaces.

A broad variety of minor subjects can be elected by a student majoring in physics. These include such traditional choices as mathematics, chemistry, and geophysics, but also other areas such as computer science, business, and electrical engineering. Students contemplating minors outside the College of Arts and Sciences should seek advice from the departmental advisor before beginning that minor.

Physics Curriculum.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
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
MATH 1351, Calculus I	3	MATH 1352, Calculus II	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
*HIST 2300, U.S. Hist. to 1877	3	*HIST 2301, U.S. Hist. since 1877	3
**POLS 1301, Amer. Govt., Org.	3	**POLS 2302, Amer. Pub. Pol.	3
P.E., Band, ROTC, or Nutr.	1	P.E., Band, ROTC, or Nutr.	1
	<u>17</u>		<u>17</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
PHYS 2402, Prin. of Phys. III	4	PHYS 3204, Intermed. Lab.	2
MATH 2350, Calculus III	3	PHYS 3301, Optics	3
†English	3	†English	3
††Foreign Language	4	††Foreign Language	4
MATH 3350, High. Math. Eng. & Sci.	3	COMS 2300	3
	<u>17</u>	MATH 3351, High. Math. Eng. & Sci.	3
			<u>18</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
PHYS 3204, Intern. Lab.	2	PHYS 3306, Elect. & Magnet.	3
PHYS 3305, Elect. & Magnet.	3	PHYS 4305, Mechanics	3
PHYS 4304, Mechanics	3	PHYS 4307, Quant. Mechanics	3
Minor	3	Social science & behavioral science	3
Elective	3	Minor	3
Technology or applied science	3		15
	17		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
Adv. phys. elective 3		Adv. phys. elective 3	
PHYS 4302, Stat. & Ther.	3	PHYS 3000, Undergrad. Research	3
PHYS 3000, Undergrad. Research	3	Minor	3
Minor	6	Elective or other requirements	3
	15	Minor or elective	3
			15

*These may be substituted by other American history courses.

**This may be substituted by other political science courses.

†See English requirement. ENGL 2301, 2302, 2307, or 2308 are recommended.

‡The following foreign languages are recommended: French, German, or Russian. The same language should be taken for two semesters.

Electives: Chemistry courses and MATH 3354, 4354 are recommended.

Teacher Education. For students seeking secondary certification to teach physics and other sciences, the following plans are available:

I. Two teaching fields of a minimum of 24 hours each: PHYS 1105, 1106, 1308, 2201, 2301, 2402, 3204, 3305, 4304; plus two courses selected from 3000- or 4000-level physics courses.

II. Composite science option. Work must be distributed over the science departments—physics, biological sciences, chemistry and biochemistry, and geosciences. The student making this choice should consult the undergraduate advisor in the Physics Department and the "Teacher Education" section of the catalog. For information on certification in physics and science, also consult the College of Education.

Courses in Physics. (PHYS)

1101. **Experimental Elementary Physics (Laboratory) (1:0:2).** Prerequisite: PHYS 1303 or concurrent enrollment. Designed to introduce students to some experimental techniques and to complement the lecture course PHYS 1303.
1103. **Experimental General Physics I (Laboratory) (1:0:2).** Prerequisite: PHYS 1306 or concurrent enrollment. Designed to introduce students to 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).** Corequisite: PHYS 1308. Designed to introduce students to a variety of experimental techniques.
1106. **Principles of Physics II (Laboratory) (1:0:2).** Prerequisite: PHYS 1105 and 1308; Corequisite: PHYS 2301. A continuation of PHYS 1105 that serves as a prerequisite for all advanced laboratory courses.
1303. **Physics for Nonscience Majors (3:3:0).** Course intended to acquaint students with the basic laws and vocabulary of physics. A minimum of mathematics is used. With laboratory PHYS 1101, this course counts toward fulfillment of the natural science requirement in Arts and Sciences.

- 1304. Physics: Basic Ideas and Methods (3:3:0).** Intended to provide physics background to pre-engineering students. Examines basic concepts in physics. Problem solving techniques, graphical representations, and pertinent mathematics.
- 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 students.
- 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 and PHYS 1105. Calculus-based introductory physics course, primarily Newtonian mechanics. Kinematics, energy, momentum (linear and angular), motion of rigid bodies, gravitation, waves, sound, heat, and thermodynamics.
- 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. Some of the physical principles are exemplified in laboratory sessions.
- 2301. Principles of Physics II (3:3:0).** Prerequisite: PHYS 1308, 1105; corequisite: MATH 1352 and PHYS 1106. Electric and magnetic fields, dielectrics, magnetic properties of materials, electromagnetism, geometrical and physical optics.
- 2402. Principles of Physics III (4:3:3).** Prerequisite: PHYS 2301, 1106. Study of atomic, molecular, and nuclear phenomena. Relativity, quantum effects, hydrogen atom, many electron atoms, and some molecular physics.
- 3000. Undergraduate Research (V1-6).** Individual and/or group research projects in basic or applied physics, under the guidance of a faculty member.
- 3204. Intermediate Laboratory (2:0:6).** Prerequisite: PHYS 1308, 2301, 2402, with laboratories, and junior standing. Laboratory course on advanced physical principles, including experiments in optics, atomic, molecular, and nuclear physics. May be repeated for credit. Students majoring in physics take the laboratory for two semesters.
- 3301. Optics (3:2:3).** Prerequisite: PHYS 1308, 2301. Geometrical and physical optics with emphasis on the latter. Waves, reflection, scattering, polarization, interference, diffraction, modern optics, and optical instrumentation.
- 3305, 3306. Electricity and Magnetism (3:3:0 each).** Prerequisite: PHYS 2301, and junior standing. Maxwell's equations, electrostatics, dielectric materials. Magnetic fields and materials. Electromagnetic waves, radiation. Relativity.
- 4000. Independent Study (V1-4).** Prerequisite: Approval of advisor. Study of advanced topics of current interest under direct supervision of a faculty member.
- 4121. Engineering Physics Seminar (1:1:0).** Prerequisite: Consent of department. Investigation of engineering problems of special interest to the student. May be repeated for credit. For engineering physics students.
- 4301. Computational Physics (3:2:2).** Prerequisite: PHYS 1308, 2301, 2402. Numerical modeling of physical systems. Data acquisition and analysis. Graphics for displaying complex results. Quadrature schemes, solution of equations. Use of microcomputers in assignments.
- 4302. Statistical and Thermal Physics (3:3:0).** Prerequisite: Knowledge of differential equations. Introduction to statistical methods in physics. Formulation of thermodynamics and statistical mechanics from a unified viewpoint with applications from classical and quantum physics.
- 4304, 4305. Mechanics (3:3:0 each).** Prerequisite: PHYS 1308, 2301, or equivalent, and differential equations. Dynamics of particles and extended bodies, both rigid and fluid, using Newtonian mechanics and the Euler-Lagrange equations from Hamilton's principle. Nonlinear systems and chaos with numerical modeling. Applications of the Navier Stokes equation.

4306. **Senior Project (3).** Prerequisite: Senior standing in physics or engineering physics. Individual research project under the guidance of a faculty member.
4307. **Introduction to Quantum Mechanics (3:3:0).** Prerequisite: MATH 3350. Experimental and conceptual bases. Dualism, uncertainty principle. Mathematical framework. Schroedinger equation, solutions. Hydrogen atom. Pauli principle, spin. Periodic table. Perturbation theory.
4309. **Solid State Physics (3:3:0).** Prerequisite: PHYS 3305 and knowledge of elementary quantum mechanics. The structural, thermal, electric, and magnetic properties of crystalline solids. Free electron theory of metals. Concept of energy bands and elementary semiconductor physics.
4310. **Atomic and Molecular Physics (3:3:0).** Prerequisite: PHYS 4307. Elementary quantum mechanics of atomic and molecular structure and spectra. Simple atoms and molecules. Selection rules, Einstein A - and B - coefficients. Molecular orbitals and bonds. Spectroscopy techniques. Lasers.
4312. **Nuclear and Particle Physics (3:3:0).** Prerequisite: PHYS 4307. Nuclear structure and nuclear models, radioactivity, alpha and beta decays, gamma transitions, nuclear reactions, nuclear energy, elementary particle classification, conservation laws, weak and strong interactions, symmetry.

Courses in Astronomy. (ASTR)

The 8 hours in ASTR 1300, 1100, 1301, and 1101 meet the 8-semester-hour Arts and Sciences requirement in lab science.

1100. **General Astronomy Laboratory I (1:0:2).** Corequisite: ASTR 1300. Lab course to accompany ASTR 1300. Use of telescopes and other instruments such as cross-staff, quadrant, spectroscope. Observation of the sun, planets and their moons, stars, nebulae, our galaxy, and other galaxies.
1101. **General Astronomy Laboratory II (1:0:2).** Corequisite: ASTR 1301. Lab course to accompany ASTR 1301. Observation with instruments, stellar spectra, Hertzsprung-Russell classification of stars, observation of regions where stars are being formed, photometry of variable stars. Telescopic observations.
1300. **General Astronomy I (3:3:0).** Corequisite: ASTR 1100. Structure of the solar system, stellar planetary systems and extraterrestrial intelligence, motion and structure of the planets and their moons, comets, minor planets and meteorites, light, telescopes.
1301. **General Astronomy II (3:3:0).** Corequisite: ASTR 1101. Study of the physical structure of the universe, theories of the universe, the big bang, probability for extraterrestrial life, stellar evolution, black holes.

Department of Political Science

Professor Nelson Dometrius, Chairperson.

University Professor Kennedy; Professors Cochran, Havens, Mayer, Oden, Pearson, Perkins, and Tamkoc; Associate Professors Burnett, C. Fox, Hannon, Rinehart, and Schaefer; Assistant Professors Christian, S. Fox, Hale, Khan, Lee, O'Callaghan, Ringquist, and Simmons.

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* (NASPAA accredited). 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, Russian language and area studies, ethnic studies, and religion 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 1301, preferably the section designated for majors. POLS 2302 may be skipped if the student receives an A or B in POLS 1301. Majors may, however, elect to take and count POLS 2302 as part of their program. All majors are required to take POLS 3310 and one of the following: POLS 3341, 3351, 3323, or 3327. In addition, majors must take any two of the following (a, b, c): (a) POLS 3330, 3331, 3332, 3333 or 3334; (b) POLS 3361; (c) POLS 3371.

The requirement for a minor in political science is 18 hours, including POLS 1301 and 2302. Minors may skip POLS 2302 if they receive an A or B in POLS 1301. Political science minors are also required to take any two of the courses listed above (a, b, c).

Political science provides excellent instruction for students interested in politics, law, journalism, teaching, or civil service. Insight into political values, domestic policy issues, and foreign policy are invaluable for students interested in such careers as well as for careers in business.

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 1301, 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 1301, 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 by completing requirements for the Bachelor of Arts. Consult the political science advisor and the College of Education for details.

The student of political science may qualify for teacher certification under a variety of plans: (1) Students desiring to have political science as their single teaching field (Option I) must complete at least 36 hours in political science, including the general degree requirements 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) Those students seeking secondary certification to teach in the broad (composite) field of social science (Option II) 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 1301 is a prerequisite for all other political science courses. Special sections of POLS 1301 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.

Courses in Political Science. (POLS)

1301. **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 1301. 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.
- *3321. **Local Government (3:3:0).** Cities, counties, and special districts are studied in terms of organization, recruitment, and services such as policy, planning, and health; fiscal problems and their impact on citizens.
- *3322. **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.
- *3323. **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.
- *3324. **Urban Politics (3:3:0).** Governmental structures, politics, settings, and selected policy problems in urban areas of the United States.
- *3325. **Political Parties (3:3:0).** Party history, functions, organization, finance, nominations, campaign methods, and elections.
- *3326. **Women in Politics (3:3:0).** A study of female political participation in the United States, including voting, campaign activity, interest group activity, and office holding.
- *3327. **The American Presidency (3:3:0).** The presidency, its constitutional basis, structure, powers, functions, and responsibilities.
- *3328. **Political Socialization (3:3:0).** The process of political learning, the agents which shape this learning, and its effect on government and the political system.
- *3329. **Ethnic Politics (3:3:0).** Political behavior and attitudes of ethnic groups, with emphasis on Black and Chicano politics.
3330. **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.
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)
3332. **Modern Political Theory (3:3:0).** Major political thinkers starting with Machiavelli and Hobbes and movements such as liberalism, conservatism, utilitarianism, socialism, and communism.
3333. **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.
- *3334. **American Political Theory (3:3:0).** Main currents in American political thought from colonial beginnings to the present day.
3339. **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.

- *3340. **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.
- *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.
- *3342. **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.
- *3346. **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.
- *3347. **Intergovernmental Relations (3:3:0).** Interactions, attitudes, and behavior of public officials of two or more units of government functioning in their public capacities. Federalism, legal authority, fiscal transfers, grantsmanship.
- *3350. **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.
- *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.
- *3352. **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.
- *3353. **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. 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.
- *3354. **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.
- *3360. **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.
- 3361. **International Politics I (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.
- 3362. **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.
- 3363. **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, and the future of world order.
- 3367. **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.

3370. **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.
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.
3372. **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.
3373. **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.
3374. **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.
3375. **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.
3376. **Asian Governments and Politics (3:3:0).** Political culture, party systems, political structure, policy-making, and foreign policy in selected Asian countries. Primary attention focused on Japan, China, and South Korea.
3378. **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.
3379. **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.
- *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.
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.
- *4343. **Science, Technology, and Public Policy (3:3:0).** Study of relationships between government, science, and technology; emphasis on political dimension of science, impact of science and technology on politics, policy problems, and regulation.
- *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.
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.
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.
- 4397. **Practicum in Politics (3).** Practical experience integrated with academic study of politics through study programs or work experience. Credit/no credit.
- 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 C. Steven Richards, Chairperson.

Professors Bell, D. Cogan, R. Cogan, Elias, George, Greene, Halcomb, C. Hendrick, Locke, Mahone, Marshall, McGlynn, Perez, Phillips, and Winer; Associate Professors Clopton and S. Hendrick; Assistant Professors Faulkner, Fireman, Iacono, Kunkel, Lambert, Mumma, Nakamura, Overby, Pope, and Taraban.

This department supervises the following degree programs: PSYCHOLOGY, *Bachelor of Arts, Master of Arts, Doctor of Philosophy.*

The advanced degree programs encompass a number of specialties within clinical, counseling, and experimental psychology. The professional programs are fully accredited by the American Psychological Association.

The undergraduate psychology curriculum is designed to provide a core of knowledge of the subject matter in experimental, theoretical, and applied psychology. Sufficient curricular flexibility is provided to permit a student to emphasize the acquisition of useful skills for later life, both vocational and personal; prepare for a graduate degree program in psychology or related field; or both.

All undergraduate psychology majors must complete the following core program: PSY 1300, 3317, and MATH 2300 or PSY 3403. Additionally, three courses must be completed from PSY 3304, 3306, 3327, 4301, 4323, and 4324. Additional electives may be selected to complete the major. Courses numbered at the 2000 level may not apply towards the major. The total number of credit hours must be at least 30 but no more than 42.

Students wishing to major in some field other than psychology but minor in psychology must complete at least 18 credit hours in psychology, including PSY 1300 and at least three courses numbered at the 3000 or 4000 level.

Psychology may be selected as a teaching field for a secondary teaching certificate. For a list of course requirements for teacher certification, students should consult with a departmental advisor.

Grades below C in psychology courses will not be acceptable for fulfilling major, minor, or teacher certification requirements.

In addition to offering regularly structured courses, the department provides opportunities to participate in various research and service activities of faculty members. These are particularly valuable for the student who intends to pursue a career in psychology. Interested students should confer with an advisor or any of the faculty with whom they come into contact. Such activities may contribute to the completion of major and/or minor requirements through enrollment in PSY 4000 during the junior and senior years.

Courses in Psychology. (PSY)

1300. **General Psychology (3:3:0)**. Introduction to fundamental concepts in psychology. Emphasis on the physiological, social, and environmental determinants of behavior. (Honors section offered.)
1301. **Introduction to Research Methods (3:3:0)**. Prerequisite: PSY 1300 or concurrent enrollment in PSY 1300. A survey of research methods in psychology. Emphasis in techniques of experimental control. Counts toward the major.
2301. **Child Psychology (3:3:0)**. Prerequisite: PSY 1300 or EPSY 3330 or F S 2320. A study of the developmental processes and environmental factors which shape the personality and affect the achievement of the child. Credit does not apply to major.
2302. **Mental Health (3:3:0)**. Prerequisite: PSY 1300 or EPSY 3330 or F S 2320. A study of the individual and social factors which contribute to the development of both healthy and unhealthy personalities. Credit does not apply to major.
2305. **Adolescent Psychology (3:3:0)**. Prerequisite: PSY 1300. A general review of approaches to the understanding of the social behavior and development of the adolescent. Physical, mental, and emotional growth and adjustment are covered. Credit does not apply to major.
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 and 6 hours of advanced work. 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. Emphasis is placed on application to psychological research problems and an introduction to computer functions.
4000. **Individual Problems Course (V1-6)**. Prerequisite: Prior consent of instructor and high scholastic achievement. Independent work under the individual guidance of a faculty member. May be repeated for up to 12 hours credit, only 6 of which may count toward fulfillment of the major in psychology.
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: 3306 or consent of instructor. 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 1301 and 3403 or MATH 230 or equivalents. A lecture-laboratory course considering the problems of experimentation in clinical, social, and experimental psychology.
- 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.
- 4329. Drugs, Alcohol, and Behavior (3:3:0).** 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.
- 4341. Social Psychological Perspectives on Close Relationships (3:3:0).** Prerequisite: PSY 3304. Social psychology theory and research on topics in close relationship literature including attitudes toward love and sexuality, friendship, intimacy, power, conflict, and divorce.

Department of Sociology

Professor Doyle Paul Johnson, Chairperson.

Professors Cartwright, Chalfant, Lowe, Peek, and Tsai; Associate Professors Chandler, Curry, Matthews, and Roberts; Assistant Professors Dunham, Elbow, and Lopez-Stafford.

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 urban studies, ethnic studies, environmental studies, and family life studies minor programs.

Areas of faculty expertise include criminology, the family, international development, medical sociology, and sociology of religion. A major or minor in

sociology is beneficial to students planning careers in such fields as business, law, international development, medicine, and social welfare.

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.

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. 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 SW 2301, 3311, 3312, 3332, 3333, 3334, 3339, 4311, 4321, 4340, and 4611. 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 generally 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 with the stipulation that at least one semester of the natural science requirement be taken in the subject area of human biology.

The social welfare program, which is accredited by the Council on Social Work Education, offers a combination of cognitive and experiential learning. Students complete a junior-level, 30-hour volunteer placement in agency settings and a senior-level, 400-hour supervised agency placement. SW 2301, 3311, 3312, and 3332 are excellent courses for enhancing the understanding of and ability to use effective interpersonal skills, applicable to a wide variety of career choices.

Social welfare may be taken as a minor course of study.

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.
- 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 and 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, business, and industrial bureaucracies in international perspective with an emphasis on internal structure, relationship between organization and society, and their impacts on human behavior.
- 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.
- 3348. Sociology of China and Japan (3:3:0).** A sociological approach to the peoples and institutions of China and Japan. Emphasis is placed on comparing Chinese and Japanese ways of life vis-a-vis the American way of life.
- 3352. Social Change (3:3:0).** Analysis of change in social systems 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.

4316. **Social Gerontology (3:3:0)**. Prerequisite: Advanced standing for undergraduates. Theory and research on aging; covering demographic, socio-cultural, economic, individual, and social factors.
4325. **Criminology (3:3:0)**. Crime and deviant behavior as a social process and their regulation in a democratic society.
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.
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.
4362. **Cities and City Life (3:3:0)**. The modern city in its ecological, cultural, and social aspects.
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.
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.
4383. **Alcohol, Drugs, and Society (3:3:0)**. Analysis of social factors related to the use and abuse of alcohol and other drugs.
4391. **Opinion Polling Analysis (3:3:0)**. Students use computers in analysis of survey data and write research reports. Open to nonmajors. Computer capability required.

Courses in Social Welfare. (S W)

2301. **Social Welfare as an Institution (3:3:0)**. Prerequisite: SOC 1301 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 I (3:3:0)**. Corequisite: S W 2301 or consent of instructor. An introduction to an ecosystems and psycho-social approach to understanding human behavior through adolescence. Emphasis on interaction among biological, social, emotional, and cultural systems.
3312. **Human Behavior and the Social Environment II (3:3:0)**. Prerequisite: S W 3311 or consent of instructor. An examination of the person-environment interaction from adulthood through old age. Emphasis on transitional issues and problems, dysfunctional, and maladaptive behavior.
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 3331. An in-depth examination of the social work methodology of social casework as an interventive means of problem solving with individuals and families.
- 3339. Social Work Research and Evaluation (3:3:0).** Prerequisite or corequisite: SOC 3391 or consent of instructor. Introduction to the cycle and process of social work knowledge building through the scientific approach. Emphasis on designs for evaluation of programs or individual practice.
- 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.
- 4340. Social Work: Field Placement Integrative Seminar (3:3:0).** Prerequisite: S W 3334 and corequisite: S W 4611. A seminar designed to increase the integration of social work knowledge and skills used in the student's individual practice of social work. (Social welfare majors only.)
- 4611. Social Work: Field Experience (6:0:30).** Prerequisite: S W 3334; corequisite: S W 4340. A closely supervised individual experience in the practice of social work knowledge, methods, and skills in a welfare or related agency. Pass-fail. (Social welfare majors only.)

Department of Speech and Hearing Sciences

Assistant Professor R. Linville, Chairperson.

Professor J. Muma; Associate Professor Hamre; Assistant Professors Culpepper, Hamill, and Harn.

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.**

The program 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 meets certification standards of the American Speech-Language-Hearing Association and Texas licensure for speech-language pathologists and audiologists.

Special features of the department include two laboratories: the Hearing Research Laboratory and the Speech Physiology Laboratory. The Hearing Research Laboratory, located in the North annex of the University Theatre Building, has state-of-the-art hearing research facilities. Auditory electrophysiologic testing for diagnostic and research purposes is conducted, as is hearing aid fitting research. Many of the experiments conducted in the lab are computer-aided, as microcomputers control signal presentation, data acquisition, and data analysis. Students are afforded the opportunity to use this equipment in their research projects. The Speech Physiology Laboratory, located in FL-18, is used to conduct research in the areas of speech acoustics, fluid mechanics, laryngeal kinematics, and speech perception. The facility provides students with opportunities to become familiar with computer-based data

acquisition, interactive therapy programs, and experimental phonetics. In addition to various peripheral hardware, there are three computers and a laser printer available for student use in the laboratory.

The department sponsors a chapter of the National Student Speech and Hearing Association. The Speech-Language and Hearing Clinic serves as a practicum site for students in the department. Under faculty supervision, students in speech-language pathology and audiology provide clinical services for the students, faculty, and staff of the University and other residents of West Texas and eastern New Mexico. Other practica are available through externship programs in public schools, hospitals, community and state agencies, private practices, and in the Texas Tech University Health Sciences Center.

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 or audiology. Students wishing to enter the preprofessional track must apply for admission upon completion of the four core courses (SHS 1320, 2321, 2322, 2323). 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 (SHS 4380, 4390) are limited to students who are admitted to the preprofessional program.

Because of confidentiality, any student enrolled in Speech and Hearing Sciences courses involving observation of or delivery of clinical services must, prior to enrollment, show evidence of malpractice insurance coverage. This insurance is available through the department at a cost of less than \$15 per calendar year.

Students seeking the B.S.S.H.S. degree must complete certain requirements in the major for the following programs.

Audiology: SHS 1320, 2120 (twice), 2321, 2322, 2323, 3324, 3341, 4342, 4343, 4426, and electives in the speech and hearing sciences to total 39 hours.

Speech-Language Pathology: SHS 1320, 2120 (twice), 2321, 2322, 2323, 3324, 3325, 3326, 3341, 4342, 4426, 4427, and electives in the speech and hearing sciences to total 36 hours.

In addition to the above, students in a preprofessional program may be required to complete up to 12 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.

Courses in Speech and Hearing Sciences. (SHS)

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).** Prerequisite: Malpractice insurance coverage. Supervised observation of clinical assessment and management of individuals with communication disorders. May be repeated for credit.
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 Disorders: Assessment and Intervention (3:3:0).** Prerequisite: Malpractice insurance coverage; 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: Malpractice insurance coverage; 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.
- 3326. Phonology and Articulation Disorders: Assessment and Intervention (3:3:0).** Prerequisite: Malpractice insurance coverage; SHS 1320, 2321, 2323, or consent of instructor. Introduction to the nature and etiologies of phonology and articulation disorders, and to the principles of assessment and treatment.
- 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.
- 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: Malpractice insurance coverage; 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.
- 4343. Pediatric Auditory Management (3:3:0).** Prerequisite: Malpractice insurance coverage; SHS 3341, 4342, or consent of instructor. The study of audiological test procedures, intervention techniques, and the use of amplifications for hearing impaired infants and children.
- 4380. Clinical Practicum: Speech-Language Pathology (3).** Prerequisite: Admission to preprofessional program; malpractice insurance coverage; 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: Admission to preprofessional program; malpractice insurance coverage; 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: Malpractice insurance coverage; SHS 1320, 2321, 2322, or consent of instructor. An introduction to assessment of communication disorders of speech and language. Laboratory assignments provide experience in specific assessments and observation techniques and report writing.

Department of Theatre Arts

Professor Richard A. Weaver, Chairperson.

Professors Ashby and Sorensen; Associate Professor Jones; Assistant Professors Askins, Christoffel, and Mitchell.

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 new student-directed plays in the Laboratory Theatre, a Summer Repertory program, and various workshops. In addition, it sponsors Alpha Psi Omega (national theatre honorary), the United States Institute of Theatre Technology, is an institutional member of the Texas Educational Theatre Association, the Southwest Theater Association, and the Association of Theatre in Higher Education.

Students seeking the B.A. degree must complete the following requirements in addition to those required by the University and 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 and 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 Education Requirements.

Students seeking the B.F.A. degree must satisfy the General Education Requirements of the University.

Core Requirements

TH A 1101, 1102, 1103, 1104, 2101, 2302, 2303, 3104, 3105, 3303, 3304, 3305, 3308, 3309, 4302, 4303.

Acting and Directing Specialization Courses

TH A 1301, 2302 (repeated), 3105 (three times), 3302 (twice), 3306, 3307, 4301 (twice), 4335. In addition, students must select 6 hours from TH A 2305, 3107, 3301, 4300, 4305, M AP (voice) 1001, 1002, 2001, 2002; 5 hours from PF&W, ESS, and DAN; and 9 hours from TH A 2305, 3107, 3301, 4300, 4305, M AP 1001, 1002, 2001, 2002, DAN 1102, 1103, 1107, 1204, 1304, 2102, 3201, 4102, 4104, 4207, PF&W, ESS, and DAN.

Design and Technology Specialization Courses

TH A 2306, 3306, 3307, 4108 (twice), 4301 (twice), 4306, 4309, and 4311; ART 1320, 1324, and 1325. Also 9 hours must be selected from TH A 3100, 3101, 3102, 3103, 4309, 4310, and 4335, ART 1310, 1311, and 2322.**

*Must total 36 hours in combination

**Students with an emphasis in scenery or costume design must take 6 of the additional 9 hours in their area of specialization.

Teacher Education. Students desiring secondary certification in theatre arts must complete the following: TH A 1301, 2302, 2303, 3303, 3304, 3305, 3306, 3309, 4302, and 4307.

Courses in Theatre Arts. (TH A)

- 1101. Theatre Activities: Scenery and Properties (1).** Opportunity to participate extensively in theatre activities in scenery and properties.
- 1102. Theatre Activities: Lighting and Sound (1).** Opportunity to participate extensively in theatre activities in lighting and sound.
- 1103. Theatre Activities: Costume and 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.
- 2305. 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. Stage Management (3:3:0).** Prerequisite: TH A 2303. An in-depth study of the functions and responsibilities of the stage manager in the performing arts.
- 3100. Advanced Theatre Activities: Stage Management (1).** Prerequisite: TH A 2306. Opportunity to participate extensively in theatre activities in stage management in University Theatre productions.
- 3101. Advanced Theatre Activities: Scenery and Properties (1).** Opportunity to participate extensively in theatre activities in scenery and properties with emphasis on leadership experiences.
- 3102. Advanced Theatre Activities: Lighting and 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 and 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.

3107. **Oral Interpretation Activities (1:0:3).** Opportunity for student participating extensively in oral interpretation activities to secure credit for this laboratory work. May be repeated up to 4 semester hours.
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.
4108. **Scene Painting (1:0:4).** Prerequisite: TH A 2302, 3303, and 3304. Study of the art and craft of scene painting styles and techniques. Repeatable for credit.
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.
4306. **Theatrical Properties and Set Dressing (3:2:3).** Prerequisite: TH A 2303, 3303. Analysis of property design. Development of skills in fabricating and procuring hand, scenic, and decorative properties.
4309. **Principles of Scene Design (3:0:6).** Prerequisite: TH A 2303, 3303, and 3304. Study of theory and practice of theatrical scene design. May be repeated for credit.
4310. **Costume Design (3:2:3).** Prerequisite: 2303 and 3304. Theory and practice of costume design for theatrical production.
4311. **Theory and Practice of Lighting Design (3:2:3).** Prerequisite: TH A 2303, 3303, and 3304. Study of the theory, process, and practice in lighting design for theatre, opera, and dance.
4335. **Beginning Script Analysis (3:3:0).** An introductory course in performance theory and script analysis.

Reserve Officer Training Corps

The Department of Military Science, the Department of Naval Science and the Department of Aerospace Studies conduct senior division Reserve Officer Training Corps programs under the auspices 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, Navy, Marine Corps, or Air Force.

The first two years of courses in the 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 unless the student has an ROTC scholarship. The courses may be substituted for the University's physical education course requirements.

To enter the junior and senior level Army Advanced Course, students must have completed the freshman and sophomore level 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, or be an honorably discharged veteran. In addition, students not otherwise qualified who have only two years remaining on their academic program may enter the Advanced Course the current semester and attend Army ROTC Basic Camp the following summer. To enter advanced standing in the Naval ROTC, students must have either fully participated in the first two years of Naval ROTC or they must successfully complete the Naval Science Institute at Newport, Rhode Island during the summer prior to their junior year. Acceptance at the Naval Science Institute is based on competitive standards which include a significant emphasis on academic performance as well as interviews by Navy or Marine Corps officers. AFROTC offers a four-year and a two-year commissioning program. For the Air Force Professional Officers Course (POC), four-year students must have completed the freshman and sophomore level General Military Course (GMC) or have received constructive credit by having completed Junior ROTC, Civil Air Patrol, or prior active duty. Two-year qualified applicants without the GMC, JROTC, CAP, or active duty time will attend six-week Field Training camp. All others will complete a four-week Field Training between their sophomore and junior years. Detailed information about the alternative programs is available from the chairperson of the respective department. Advanced Course, Professional Officers Course, and scholarship students receive a monthly stipend of \$100 for up to 12 months per year.

In addition to completing the above requirements, students who wish to enroll in the ROTC commissioning program must be citizens of the United States, be not less than 17 years of age, and be able to complete work for a baccalaureate degree and all other requirements for commissioning prior to their 30th birthday (34th birthday with waiver for prior service). For the Navy and Marine Corps, students must be less than 25 years of age on June 30 of the calendar year in which they are commissioned if they are enrolled in the scholarship program and less than 27-1/2 if enrolled in the college program. Waivers may be granted up to a ceiling of less than 29 years of age on June 30 of the calendar year in which they are commissioned if they have had prior active service. For the Air Force, students must finish their baccalaureate degree and all other requirements for commissioning by the time they are 26-1/2 years

old if they are programmed for flight training; up to 34 years old with waiver if programmed for other than flight training. All ROTC program students must have a cumulative GPA of 2.00 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, Professor of Naval Science, or Professor of Aerospace Studies, as appropriate. Upon admission into the Advanced Course or Professional Officers Course students sign a contract to seek a commission as an ensign or a second lieutenant.

One feature of the ROTC programs is summer training off campus. Army cadets attend the six-week Army Advanced Camp between their junior and senior years. Air Force Field Training, of four or six weeks' duration, is scheduled throughout the summer and is normally completed between the student's sophomore and junior years. See the Department of Naval Science section for Navy and Marine Corps summer training information.

Scholarships. The departments of Army, Navy, and Air Force offer competitive 4-year ROTC scholarships to selected high school seniors. Additionally, the Army offers 3- and 2-year scholarships to outstanding students selected by the Professor of Military Science and a board of Army and University officials. Eligible freshman, sophomore, and junior NROTC midshipmen may apply for 3-1/2-, 3-, 2-1/2-, 2-, 1-1/2-, and 1-year scholarships once in the program. Eligible freshman and sophomore AFROTC cadets may be nominated for 3-1/2-, 3-, 2-1/2-, and 2-year scholarships once in the program. ROTC scholarships provide textbook reimbursement, tuition, and fees as well as a monthly subsistence allowance of \$100 during the fall and spring semesters.

Flight Training. Air Force ROTC pilot candidates without private pilot licenses must successfully complete the Air Force's Light Aircraft Training Program (LATR). LATR consists of ground and flight instruction, serves to screen pilot candidates, and provides the best possible candidates to UPT.

Commissioning. Upon receiving a commission, the Army ROTC lieutenant will enter full-time active duty service or part-time service with the Army Reserves or National Guard. Selection for active duty is competitive. For those who wish to combine a career with part-time military service, contracts are available which guarantee that the cadet can serve all of his or her commitment in the Army Reserves or National Guard. Cadets may also apply for educational delays for graduate training. Air Force cadets agree to serve 4 years on active duty if in a nonflying career field, 10 years upon completion of undergraduate pilot training, or 6 years upon completion of undergraduate navigator training. All Air Force commissions are for active duty assignment only. See the Department of Naval Science section for Navy and Marine Corps service requirements.

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, Naval Science, or a combination thereof.

Department of Aerospace Studies

Professor Col Edward J. Sheeran, Chairperson.
Associate Professor Maj Myrick; Assistant Professors Capt Emery, and Capt Lamb.

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 professionalism and 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, 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 of AFROTC, 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 academic year in an approved foreign language.

Professional Officer Course. Application for the POC normally starts one year prior to POC entry. This course introduces the cadet in the first year to the 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 security 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 as full-time students, 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 and are selected by HQ AFROTC through a competitive screening process.

Cadets who complete the AFROTC professional officer course are commissioned upon graduation and enter active duty as Air Force second lieutenants.

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 Bernard F. Fisher Leadership Awards go each regular semester to the freshman, sophomore, 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 Precision Drill Team. 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 and Air Force programs. Membership selection is based on poise, personal appearance, personality, and scholastic standing.

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. There are numerous program opportunities available for cadet participation on a voluntary basis within the Advanced Training Program (ATP). ATP consists of two weeks of training by "shadowing" an active duty officer in a career field related to the cadet's category.

Courses in Aerospace Studies. (AERS)

First Year

1105. **The Air Force Today (1:1:1-1/2).** 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 (1:1:1-1/2).** 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 Development of Air Power I (1:1:1-1/2).** 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 (1:1:1-1/2).** 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 (3:3:1-1/2).** 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 officer's professional skills as an Air Force leader.
- 3306. Air Force Leadership and Management (3:3:1-1/2).** 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 (3:3:1-1/2).** 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 (3:3:1-1/2).** 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 Academy. 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 LTC. E. Allen Carrigo, Chairperson.

Assistant Professors Maj. Wright, Cpt. Cross, and Cpt. Crum.

The Army Reserve Officers' Training Corps program of instruction is designed to prepare university students for commissioning as officers for the active Army, the Army Reserve, and the Army National Guard. This purpose is viewed as an integral aspect of our national security since Army ROTC provides over 70 percent of the commissioned officers serving in the Army reserve components and the active Army. It is for this reason that Army ROTC seeks quality men and women who are willing to accept the responsibilities inherent with officership. The training program is designed to teach military skills and to enhance the individual's innate abilities in communications, leadership, and physical aptitude.

The four-year Army ROTC program is divided into the Basic Course (first two years) and the Advanced Course (the last two years). Students, other than scholarship winners, incur no military obligation during the first two years.

Basic Course. Enrollment in the basic course is open to all full-time students at Texas Tech who are US citizens or immigrant aliens. Students must be capable of participating in rigorous physical training. During the first two years, students observe and experience motivational techniques and human relations practices specifically developed to assist them in their adjustment to the university environment. A tutorial program is provided to assist ROTC students in making the academic transition to higher education. Outdoor and survival skills, including land navigation with a compass and topographic map, weapons marksmanship and safety, first aid, rappelling, and physical conditioning are taught in both classroom and outdoor laboratory. Course content also includes structure of the Army and its relationship within American society, customs and courtesies of the Army, leadership, values, interpersonal communications, and comparative studies of the life-style of the Soviet and the American soldier. Leadership, decision-making, and organizational skills are emphasized in all training activities.

Advanced Course. The junior and senior level courses offer in-depth study of individual and group behavior and personnel management. The courses are designed to allow students to develop leadership and organizational skills during laboratory periods. Emphasis is on individual and small unit combat tactics, accelerated physical training, and basic soldier skills in order to assure successful completion of the Advanced Camp between the junior and senior years. Military history is used in both years to teach the development of strategy and tactics. During the senior year, students study the importance of ethics and professionalism for the military officer. Students are required to develop skills in oral and written communications as well as techniques of instruction.

Military Science Organizations. This department sponsors the local chapter of Scabbard and Blade, the national military honor society. It also sponsors intramural athletic teams, the Officer Christian Fellowship, and the following organizations:

Ranger Challenge Team. This 9 member team represents the Texas Tech Army ROTC program at competitive meets in the Texas-Oklahoma-Kansas area. The purpose of the Ranger Challenge is to test the abilities of the top cadets

in small unit competition designed to promote exciting, challenging training and the opportunity for interaction with cadets from other schools within the region. Team members are selected competitively in the areas of physical fitness, endurance, marksmanship, and proficiency in basic soldier skills.

Counter guerrilla Unit. Members of the unit are afforded the opportunity to apply classroom leadership and tactics instruction in a realistic situation. In addition to weapons and tactics instruction, participation in the unit develops confidence in each member's leadership ability, teamwork, and spirit. Membership is open to all Army ROTC students who meet unit and University standards.

Pershing Rifles. The Pershing Rifles provides extensive opportunities for members to practice leadership techniques by executing and teaching dismounted drill with or without rifles. The group provides color guards for Texas Tech football games and participates in parades and civic ceremonies in the Lubbock area. The PRs are also active in parades and drill competition in the region and the entire Southwest. Previous drill experience is not necessary, and membership is open to all Army ROTC cadets who meet Pershing Rifles and University standards.

Guardian Gold. The Guardian Gold is a co-ed service and social organization of University students (both cadet and noncadet) qualified for membership by motivation, personality, 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 open to all students who meet the standards of the organization and the University.

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 standard of the organization and the University.

Awards and Recognition. Awards and decorations are presented each semester to Military Science students in recognition of outstanding performance in academics, military science, athletics, and physical training. Awards range from cadet ribbons and certificates to organization decorations and scholarships.

Summer Training.

Basic Camp. Students desiring to enter the Military Science program, who have no prior military service and have only 2 to 2-1/2 years remaining prior to graduation, may choose to attend a six-week ROTC Basic Camp at Ft. Knox, Kentucky. Satisfactory completion of this camp satisfies the requirements for the Basic Course. Upon completion of Basic Camp, students may then contract and enter the Advanced Course. Transportation, room and board, and an allowance are paid for the six-week period.

Advanced Camp. All Advanced Course students must complete this six-week camp at Ft. Riley, Kansas, between the junior and senior years or immediately following completion of MS IV. Transportation, room and board, and an allowance are paid for the period. The program of instruction here is designed to be the capstone for all military education up through and including the MS III year.

Nurses Summer Training Program. Students seeking a BSN and a commission in the Army Nurse Corps may choose to attend a six-week camp for nursing students in lieu of the regular advanced camp. Following a week of field training, students are then assigned to an Army hospital for the remaining five weeks. During this time, nursing students work one-on-one with an Army nurse putting into practice the clinical skills learned in college.

Special Schools. Army ROTC students may apply for summer training in Army Airborne, Air Assault, Northern Warfare, Jungle Warfare, Ranger, or Russian Language School. In addition, MS III level students may request assignment to a Cadet Troop Leadership Training (CTLT) position for additional experience with an active Army unit. CTLT training is normally for 3 weeks; however, a few positions may be available for extended training (5 weeks) overseas.

Simultaneous Membership Program (SMP). Advanced course students who are eligible to enlist in either an Army Reserve or Army National Guard unit may serve in both ROTC and the reserve component simultaneously. The financial benefits generally exceed \$360 per month.

Supplemental Course Requirements. Prior to graduation, a student seeking an Army commission must complete five professional military education courses which are in addition to the Military Science classes. These courses may be part of the student's degree plan and include a minimum of one course from each of the following: written communication, human behavior, military history, computer literacy, and math reasoning.

Field Training Exercises. Field Training Exercises (FTXS) are conducted during one or more weekends during each semester at the Tech Land Training Area, Holly Park, and/or the ROTC Training Area (Macy Ranch) at Post, Texas. FTX activities include such things as helicopter flights, rappelling, land navigation, marksmanship, and small unit tactics. These weekend activities are optional for Basic Course students but are required for Advanced Course cadets.

Courses in Military Science. (MILS)

BASIC COURSE

First Year

- 1101. **Introduction to Military Subjects (1:1:1).** Introduces basic fundamentals of land navigation, the sport of orienteering, and elementary rappelling. Also presents weapons safety and marksmanship, personal physical fitness programs, and group dynamics. Introduces the student to customs, courtesies, and traditions of the Army.
- 1102. **Introduction to Military Subjects (1:1:1).** Provides practical application in individual tactical techniques, rappelling, and emergency first aid. Studies U.S. soldier and equipment, and the total Army concept. Also establishes a personal physical fitness program and presents weapons safety and marksmanship.

Second Year

- 2201. **A Study of Military Organization and Affairs (2:2:1).** Prerequisite: MILS 1101 and 1102 or consent of instructor. First aid techniques, land navigation, and leadership principles. Introduction to principles of warfare, role of the NCO, and Soviet military organizations. Intensified physical fitness training.
- 2202. **Military Traditions and Basic Soldier Skills (2:2:1).** Prerequisite: MILS 2201 or equivalent. Introduction to military correspondence, branches of the Army, and U.S. military history. Intensified leadership training, with emphasis on professional ethics and physical fitness.

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/or 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. Field training exercises are held to complement the classroom and lab training.
- 3302. Practical Applications of Military Leadership and Planning (3:3:1).** Prerequisite: Lower division Military Science course or equivalent and/or 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. Field training exercises are held to complement the classroom and lab training.

Fourth Year

- 4301. Military Leadership and Ethics (3:3:1).** Prerequisite: MILS 3301 and 3302. 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 3301 and 3302. 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: Consent of instructor. Individualized studies in military topics, leadership management problems, and military policies.

Leadership Laboratory. All students enrolled in Military Science are required to enroll in the Leadership Lab 501. Students are given the opportunity during lab to practice skills learned in the classroom. Each student is assigned to a specific cadet company within the cadet battalion and is normally advanced in leadership position in accordance with class level and experience. The laboratory location will vary from the classroom to the Tech land training area or Buddy Holly Park. Generally, lab training is conducted by Advanced Course students.

Department of Naval Science

Professor Captain Virgil F. Jackson, Chairperson.

Associate Professor Commander Gwinn; Assistant Professors Lieutenant Bilton, Lieutenant Brown, Major Mengelkoch USMC, and Lieutenant Commander Rayhons.

Texas Tech's NROTC unit was established in 1985. The Naval Reserve Officers Training Corps (NROTC) offers young men and women the opportu-

nity to qualify for a full scholarship and a commission in the Navy or Marine Corps. NROTC midshipmen are required to complete the naval science courses and attend weekly laboratory, drill, and physical fitness training sessions. During summer vacations, NROTC midshipmen participate in active duty at-sea or shore-based training cruises for approximately four weeks. Students may enroll in the NROTC program before beginning their freshman year or before beginning their junior year. Upon completing University degree requirements and the naval science program, qualified midshipmen are commissioned as ensigns in the Navy (Navy option) or second lieutenants in the Marine Corps (Marine Corps option).

Students may join the NROTC through any one of the following four programs:

Four-Year Scholarship Program. Students enter the NROTC Four-Year Scholarship Program through national competition and are appointed midshipmen in the Naval Reserve. While enrolled, the government provides tuition, fees, uniforms, and an allowance of \$100 per month. On graduation, students are commissioned with an eight-year active and reserve obligation, with an obligation to serve on active duty for at least four years. Scholarship program students must complete the required naval science courses and participate in three summer training periods of approximately four weeks each.

Two-Year Scholarship Program. Students in good standing may qualify to enroll in the Two-Year Scholarship Program. Selection for this program is made by the Navy Department, based on the student's academic record, physical qualifications, and an interview. Application is made during the second term before their junior year. Selected applicants attend six weeks of instruction at the Naval Science Institute (NSI) at Newport, Rhode Island, during the summer before their junior year. At NSI, students take courses in naval science, physical fitness, and drill similar to that required of four-year NROTC students during their freshman and sophomore years. Successful completion of the NSI qualifies two-year applicants for appointment as midshipmen in the Naval Reserve and enrollment in the NROTC Scholarship Program. Upon accepting this appointment, these students receive all the benefits and assume all the obligations of the last two years for midshipmen in the Four-Year Scholarship Program.

Four-Year College Program. The Four-Year College Program is a nonscholarship program, and students are enrolled upon acceptance by the Department of Naval Science. Uniforms are provided, and during their junior and senior years they receive \$100 per month if selected to advanced standing. Students are obligated to complete the prescribed naval science curriculum, attend one summer at-sea training period, accept a commission in the Naval Reserve or Marine Corps Reserve on graduation with an eight-year active and reserve obligation, and serve on active duty after graduation for three years. Following commissioning, application for transfer to the regular Navy or Marine Corps may be made. Midshipmen enrolled as college program students, having satisfactory academic records, and medically qualified, may compete for scholarships awarded by the Chief of Naval Education and Training each semester.

Two-Year College Program. Students in good standing may qualify to enroll in the advanced Two-Year College Program by successfully completing the Naval Science Institute (NSI) during the summer before their junior year. Application is made during the second term of the sophomore year, and, upon

acceptance, students will receive all benefits and assume all obligations of the junior and senior midshipmen in the Four-Year College Program.

Requirements for All Candidates. Qualifications for acceptable candidates for the above programs include U.S. citizenship, fulfillment of physical requirements, and willingness to participate in required summer training periods and to accept the appropriate commission in the Navy, Marine Corps, Naval Reserve, or Marine Corps Reserve when offered.

In addition to the requirements of the student's major and college core curriculum, all NROTC Navy option scholarship students must complete one year of college calculus through differential and integral calculus of one real variable, one year of calculus-based physics, one semester of a foreign language, and one semester of computer science.

Naval Science Institute (NSI). A six-week training program is conducted each summer at a naval installation by the Chief of Naval Education and Training for two-year students entering the Advanced Course of the NROTC program. The academic portion of NSI is equivalent to the naval science courses conducted during the NROTC Basic Course.

Courses in Naval Science. (NAVY)

1201. **Introduction to Naval Science (2:2:1-1/2).** An introduction to the naval profession; concepts of seapower; and the mission, organization, and warfare components of the Navy and Marine Corps. An overview of officer and enlisted ranks and rates, training and education, career patterns, naval courtesies and customs, military justice, leadership, and nomenclature.
3204. **Sea Power and Maritime Affairs (2:2:1-1/2).** Survey of U.S. naval history from the Revolution to the present includes Mahanian geopolitical theory; present-day concerns in sea power and maritime affairs—merchant marine commerce; the law of the sea; the Russian navy and merchant marine; and comparison of U.S. and Soviet naval strategies.
3302. **Naval Ships Systems I (Engineering) (3:3:1-1/2).** A study of ship characteristics and types including ship design, hydrodynamic forces, stability, compartmentation, propulsion, electrical and auxiliary systems, interior communications, ship control, damage control, and basic concepts of the theory and design of steam, gas turbine, and nuclear propulsion.
3303. **Naval Ships Systems II (Weapons) (3:3:1-1/2).** Explores the theory and employment of weapon systems; fire control systems; major weapons types, including capabilities and limitations; the physical aspects of radar and underwater sound; and the facets of command, control, and communications as a means of weapons system integration.
3305. **Navigation and Naval Operations I (3:3:1-1/2).** Study of piloting navigation through use of charts, visual and electronic aids, and theory and operation of magnetic and gyro compasses. Celestial navigation study through the celestial coordinate system, spherical trigonometry, theory and operation of the sextant, and treatment of the sight reduction process.
3306. **Navigation and Naval Operations II (3:3:1-1/2).** Study of international and inland rules of the nautical road; relative-motion vector-analysis theory, relative motion problems, formation tactics, and ship employment. Includes introduction to naval operations and operations analysis, ship behavior and characteristics in maneuvering, applied aspects of ship handling, and afloat communications.
3307. **Evolution of Warfare (3:3:1-1/2).** Survey of warfare development from the dawn of recorded history to the present focusing on the impact of major military theorists, strategists, tacticians, and technology. Emphasis is placed on basic strategy, an understanding of military alternatives, and historical precedent in military thought and actions.

4208. **Leadership and Management I (2:2:1-1/2).** Advanced-level study of organizational behavior and management within the naval organization. Includes a survey of management functions, individual and group behavior, motivation and leadership, major behavioral theories, decision making, communications, responsibility, and authority. Practical applications by experiential exercises, case studies, and laboratory discussions.
4209. **Leadership and Management II (2:2:1-1/2).** Junior officer responsibilities in naval administration: a study of counseling methods, military justice administration, human resources management, directives and correspondence, personnel administration, material management and maintenance, and supply systems. This course builds on and integrates the professional competencies developed in prior course work and training.
4310. **Amphibious Warfare (3:3:1-1/2).** Historical survey of the development of amphibious doctrine and conduct of amphibious operations. Emphasis is placed on the evolution of amphibious warfare in the 20th century, especially during World War II, and present-day potential and limitations including the rapid deployment force concept.

Naval Laboratory. Two hours of instruction conducted during each class week of the academic year provide training in general military topics, military drill, information briefings, inspections, physical fitness testing, summer cruise brief and debrief, and applied instruction and exercises in topics from the naval science academic courses.



College of Business Administration

Professor Carl H. Stem, *Dean*

Horn Professors Conover, J. G. Hunt, and S. Hunt; Professors Anderson, Austin, Barton, Blair, Bowlin, James Burns, Jane Burns, P. Cheney, Clancy, Dukes, Freeman, Hein, Howell, Lampe, Lawless, Macy, Mann, M. Peterson, R. Peterson, Randolph, Sears, White, Whitehead, Wilcox, and Wilkes; Associate Professors Boal, Bravoco, Dunne, Finn, Gately, Goebel, Hennessey, Kasper, Krefting, Luchsinger, Ma, MacDonald, Phillips, Ritchey, Savage, Sorenson, Wade, Westfall, Wood, and Yadav; Assistant Professors Areni, Bremer, Duhan, Green, Hale, Kiecker, Lemler, Menon, Nichols, Rao, Ricketts, Sutton, and Walter; Lecturers Barnhill, Bertram, J. Cheney, Faver, Hughes, Kelley, Kennedy, McWhorter, Pratas, Ramirez, Schuetzeberg, Trotter, and Volker; Visiting Assistant Professor Futoran.

The College of Business Administration offers educational programs in the administration of 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 insures a better prepared faculty. The college seeks to emphasize the understanding and application of knowledge rather than merely the acquisition of expertise.

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.

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 Philosophy*. At the undergraduate level, students may major in Accounting, Economics, Finance, General Business, Management, Management Information Systems, Marketing, and Petroleum Land Management.

The B.B.A. degree program is separated into lower division and upper division requirements. Students remain in the lower division until they have completed all of the freshman and sophomore courses in the lower division with the appropriate grade, and have at least a 2.50 cumulative GPA for all work at Texas Tech (including repeated courses).

150 Program-Joint BBA-Master's

This program is a 150-hour track leading to a Bachelor of Business Administration degree and a master's degree in business administration or accounting; 114 hours of course work is undergraduate and 36 hours is graduate. The program is designed for academically outstanding undergraduate students who wish to complete a master's degree while at Texas Tech. This can enhance both starting salaries and career advancement.

Students should apply and be accepted to the graduate component of the program during the first semester of their senior year. Graduate course work

cannot be taken prior to acceptance. Application materials are available in the College of Business Undergraduate and Graduate Programs Offices.

Admission requires:

A minimum 1150 formula total (GMAT score + 200 [GPA on last 60 hours]) for unconditional admission. The Master of Science in Accounting requires a 3.0 GPA on the last 60 hours. A minimum 500 GMAT score is required (The GMAT must be taken prior to acceptance. It is given four times a year). A minimum 3.0 cumulative GPA is required in business administration courses.

Lower Division

*B A 1390—*Business Enterprise*

*ENGL 1301—*Essentials of College Rhetoric* (Prerequisite: Minimum SAT-370; ACT-16 or completion of ENGL 0301. ENGL 0301 cannot be used in degree program.)

*ENGL 1302—*Advanced College Rhetoric* (Prerequisite: ENGL 1301). Sophomore English—One course chosen from ENGL 2301, 2302, 2307, 2308 (Prerequisite: ENGL 1302) or PHIL 2320.

*MATH 1330—*Introductory Mathematical Analysis* (A mathematics course must be taken each enrollment until the mathematics requirement is satisfied since both MATH 1330 and 1331 must be completed with a grade of C or higher before any required sophomore business courses may be taken. Prerequisite: High school algebra I & II plus minimum 400 SAT or 14 ACT or MATH 0302. MATH 0302 will not be used in the degree program.)

*MATH 1331—*Introductory Mathematical Analysis* (Prerequisite: MATH 1330).

HIST 2300—*History of the U.S. to 1877* (or other U.S. history course).

HIST 2301—*History of the U.S. since 1877* (or other U.S. history course). Only 3 hours of the U.S. history requirement can be credit by exam.

Humanities—One course chosen from ART 1310, 1311, CLAS 1320, ENGL 2301, 2302, 2307, 2308 (whichever course was not used to satisfy the sophomore English requirement), any foreign language, HIST 1300, 1301, HUM 2301, 2302, M LT 1308, 2308, 2309, PHIL 2300, or 2320.

Laboratory Science—Two courses (8 hours) chosen from biology, chemistry, geosciences, physics, ANTH 2400, or GEOG 1301 and/or 1302. Courses do not have to be in the same area, but must include the appropriate lab. (Petroleum Land Management majors should take geology.)

Physical Fitness Freshman Activities—2 semesters (freshman ROTC or M EN 1103—Marching Band will substitute).

POLS 1301—*American Government, Organization*

POLS 2302—*American Public Policy* (Prerequisite: POLS 1301). Only 3 hours of the political science requirement can be taken credit by exam.

*ECO 2301—*Principles of Economics I (micro)*

*ECO 2302—*Principles of Economics II (macro)*

*ACCT 2300—*Elementary Accounting I* (Prerequisite: MATH 1330, 1331 with grade of C or higher).

*ACCT 2301—*Elementary Accounting II* (Prerequisite: MATH 1330, 1331 with grade of C or higher and ACCT 2300).

*ISQS 2340—*Introduction to Computers in Business* (Prerequisite: MATH 1330, 1331 with grade of C or higher).

*ISQS 2445—*Introduction to Business Statistics* (Prerequisite: MATH 1330, 1331 with grade of C or higher).

Elective—Any 3-hour non-B.A., non-Eco. free elective

Exceptions:

Management Information Systems majors take *ISQS 2341 (after ISQS 2340) instead of elective.

Petroleum Land Management majors take *an approved Geology course instead of elective.

Accounting majors take PSY 1300 instead of elective.

*A grade of C or higher is required in Lower Division Core.

A sample schedule is shown below. Laboratory sciences, history, political science, humanities, physical fitness, and nonbusiness elective may be taken during either the freshman or the sophomore year.

1st Semester	2nd Semester	3rd Semester	4th Semester
MATH 1330 Lab. Science HIST 2300 B A 1390 ENGL 1301	MATH 1331 Lab. Science HIST 2301 Humanities ENGL 1302 PF&W	ISQS 2340 or 2445 ACCT 2300 POLS 1301 ECO 2301 Soph. English PF&W	ISQS 2340 or 2445 ACCT 2301 POLS 2302 ECO 2302 Non-B.A., non-Eco. elective

Upper Division

To be admitted to the upper division, a student must complete all freshman and sophomore courses required in the lower division, earn grades of C or higher on the lower division core courses (B A 1390, ENGL 1301, 1302, MATH 1330, 1331, ECO 2301, 2302, ACCT 2300, 2301, and ISQS 2340, 2445), and must have a 2.50 or higher cumulative GPA (including repeated courses) on all work attempted at Texas Tech. Junior or senior business or economics courses can be taken when these requirements are met.

Course Requirements.

Upper Division Core (24 hours) in which a grade of C or higher 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, or petroleum land management. All major courses must have a grade of C or higher.

Electives. Electives are the only courses that may be taken by pass-fail or correspondence.

Accounting Major. (30 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 obtain a B.B.A. degree with a major in accounting or to take selected junior and senior accounting courses. In addition to the 2.60 GPA in accounting, a 2.70 cumulative GPA on all courses attempted at Texas Tech (including repeated courses) is prerequisite for ACCT 3305 and 3306. A psychology course must be taken to satisfy the lower division non-B.A., non-Eco. elective.

5th Semester	6th Semester	7th Semester	8th Semester
ACCT 3304, 3307 FIN 3320 ECO 3344 MGT 3373	ACCT 3305, 3306, 3315 MGT 3370 ECO 3311 ENGL 3365 or COMS 3308	ACCT 4301, 4303 MKT 3350 BLAW 3391 Non-B.A., non-Eco. elec.-3 hrs.	BLAW 3392 Sr. Acct. courses-9 hrs. MGT 4380 Non-Acct. elective-3 hrs. or enough to complete 129 hrs. (+ 2 PF&W)

Senior accounting courses include ACCT 4302, 4304, 4306, 4307, 4308, 4309, 4310.

150 Accounting.

5th Semester	6th Semester	7th Semester	8th Semester
ACCT 3304 ACCT 3307 FIN 3320 ISQS 3344 MGT 3373	ACCT 3305 ACCT 3306 ACCT 3315 MGT 3370 ECO 3311	ACCT 4301 ACCT 4303 MKT 3350 BLAW 3391 Non-B.A./non-Eco elect.- 3 hours or enough to have total of 114+2 PF&W	*Approved undergrad. elect. —3 hrs. BLAW 3392 Taxation concentration: ACCT 5318 *Grad. elect. Other concentrations: ACCT 5303 ACCT 5319

*As approved by the faculty program advisor.

The graduate elective, ACCT 5303, 5318, and 5319 are not included in the 114 plus 2 PF&W undergraduate hours required.

Upon completion of all requirements for the MSA degree, the BBA degree will be granted.

Economics Major. (21 semester hours)

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320 MKT 3350 MGT 3370, 3373 ECO 3311	ISQS 3344 BLAW 3391 Group A-3 hrs. ECO 3312 ECO 3323 or FIN 3323	ECO 4323 Group A-3 hrs. Group B-6 hrs. Non-B.A., non-Eco. elect. —3 hrs.	MGT 4380 Elective-9 hrs. or enough to complete 120 hrs. (+2 PF&W)

Group A-ECO 3320, 3326, 4332 (or FIN 4328), FIN 4323. Group B-ECO 3322, 3333, 4300, 4331, 4333, 4334, MGT 4372, remaining Group A courses.

150 Economics.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320 MKT 3350 MGT 3373 ECO 3311 MGT 3370	ISQS 3344 BLAW 3391 ECO 3312 ECO 3323 OR FIN 3323 Group A-3 hours	ECO 4323 Group A-3 hours Group B-6 hours Free elective-3 hours	MGT 4380 Free elective-3 hours or enough to have total hours of 114+2 PF&W *ISQS 5342 *ISQS 5347

*Not included in the 114 (+2 PF&W) undergraduate hours required.

Upon satisfactory completion of the undergraduate requirements of 114 (+2 PF&W) hours and ISQS 5342 and 5347, the BBA degree will be awarded.

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.

It is recommended strongly that students have a 2.60 GPA in ACCT 2300, 2301, ISQS 2445, FIN 3320, and ECO 2301 before declaring finance as a major.

A 2.70 cumulative GPA on all courses attempted at Texas Tech (including repeated courses) is a prerequisite for ACCT 3301 and FIN 3323.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320, 3323 ACCT 3301 BLAW 3391 MGT 3373	MGT 3370 ISQS 3344 ACCT 3304 ECO 3311 MKT 3350	FIN 4324, 4329 ECO 3320 Group A-6 hrs.	FIN 4330 MGT 4380 Group B-3 hrs. Non-B.A., non-Eco. elect. -3 hrs. Elective-3 hrs. or enough to complete 123 hrs. (+2 PF&W)

Group A-FIN 3332, 3334, 4323, 4325, 4328, 4333, 4335, 4336. Group B-ACCT 3305, 3306, 3307, 3315, 4310, ISQS 3348, ECO 3322, 3324, 3326, 3330, 4323, remaining Group A courses.

Finance Major—Real Estate Specialization. (30 semester hours)

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320, 3323 ACCT 3301 BLAW 3391 MGT 3373	MGT 3370 ECO 3311 ACCT 3304 ISQS 3344 MKT 3350	ECO 3320 FIN 4324 Group A-6 hrs. Non-B.A., non-Eco. elect. -3 hrs.	MGT 4380 FIN 4329, 4330 Group A-3 hrs. Elective-3 hrs. or enough to complete 123 hrs. (+2 PF&W)

Group A-FIN 3332, 3334, 4333, 4335, 4336, BLAW 3393.

150 Finance.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3323 ACCT 3301 MGT 3373 BLAW 3391 FIN 3320	MGT 3370 MKT 3350 ISQS 3344 ACCT 3304 ECO 3311	FIN 4324 FIN 4329 ECO 3320 Group A-6 hours	MGT 4380 FIN 4330 Free elective only if needed to have total hours of 114 +2 PF&W *ISQS 5342 *ISQS 5347

*Not included in the 114 (+2 PF&W) undergraduate hours required.

Upon satisfactory completion of the undergraduate requirements of 114 (+2 PF&W) hours and ISQS 5342 and 5347, the BBA degree will be awarded.

General Business Major. (21 semester hours)

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320 MGT 3370, 3373 ECO 3311 MKT 3350	Advanced courses-9 hrs. BLAW 3391 ISQS 3344	Advanced courses-9 hrs. Non-B.A., non-Eco. elect. -3 hrs. Elective-3 hrs.	Advanced course-3 hrs. MGT 4380 Electives-6 hrs. or enough to complete 120 hrs. (+2 PF&W)

Advanced courses:

21 hours—Choose 21 hours from at least four areas in B.A. (Accounting, Finance, ISQS, Management, Marketing). The 21 hours must include at least 12 hours senior level.

150 General Business.

5th Semester	6th Semester	7th Semester	8th Semester
MGT 3350 MGT 3370 MGT 3373 ECO 3311 FIN 3320	Major courses—9 hours ISQS 3344 BLAW 3391	Major courses—9 hours Free electives—6 hours or enough to have total hours of 114+2 PF&W	Major course—3 hours MGT 4380 *ISQS 5342 *ISQS 5347

*Not included in the 114 (+2 PF&W) undergraduate hours required.

Upon satisfactory completion of the undergraduate requirements of 114 (+2 PF&W) hours and ISQS 5342 and 5347, the BBA degree will be awarded.

Management Major. (21 semester hours)

The undergraduate management program provides high quality preparation for a wide range of managerial careers. Students may group courses to emphasize personnel-organizational behavior or general management.

The personnel-organizational behavior emphasis prepares students for entry level positions in specialized personnel functions such as industrial relations, training, wage and salary administration, recruiting, and selection. In smaller organizations positions are often available assisting the personnel director.

Those with a general management emphasis are particularly suited for management training programs sponsored by many larger firms. These programs serve as the first step up the management ladder.

5th Semester	6th Semester	7th Semester	8th Semester
MGT 3370, 3373, 3376 FIN 3320 ECO 3311	MGT 3374, 3379 MKT 3350 BLAW 3391 ISQS 3344	Group A—9 hrs. Non-B.A., non-Eco. elect. —3 hrs. Elective—3 hrs.	MGT 4380, 4397 Elective—6 hrs. or enough to complete 120 hrs. (+2 PF&W)

Group A — ISQS 3343, MGT 3396, 4370, 4371, 4372, 4373, 4374, 4375.

150 Management.

5th Semester	6th Semester	7th Semester	8th Semester
MGT 3370 MGT 3376 ECO 3311 MGT 3373 FIN 3320	BLAW 3391 ISQS 3344 MKT 3350 MGT 3374 MGT 3379	Group A—9 hrs. Free electives—6 hrs. or enough to have total hours of 114+2 PF&W	MGT 4380 MGT 4397 *ISQS 5342 *ISQS 5347

*Not included in the 114 (+2 PF&W) undergraduate hours required.

Upon satisfactory completion of the undergraduate requirements of 114 (+2 PF&W) hours and ISQS 5342 and 5347, the BBA degree will be awarded.

Management Information Systems Major. (21 semester hours)

The Information Systems and Quantitative Sciences (ISQS) area has a major field called management information systems (MIS). The MIS graduate is prepared to be the liaison person between managers and computers and is therefore in great demand by industry. A 2.70 cumulative GPA on all courses attempted at Texas Tech (including repeated courses) is prerequisite for ISQS 3348. ISQS 2341 should be taken in lower division. At least 3 hours of electives must be non-B.A., non-Eco.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320 MGT 3373 MKT 3350 ISQS 3343, 3347	ISQS 3344, 3346, 3348 BLAW 3391 Non-BA/non-eco. elective -3 hrs.	MGT 3370 ECO 3311 ISQS 3349, 4348 Restricted elective-3 hrs.	MGT 4380 Restricted elective-3 hrs. ISQS 4349 Non-B.A./non-Eco. elect. -3 hrs. or enough to complete 120 hrs. (+ 2 PF&W)

Restricted Electives—Any junior or senior level course in B.A. or computer science or any other upper level courses as approved by a faculty advisor. (Some approved and recommended courses are: ENGL 3365, COMS 3308, MGT 4370, B A 4382, ACCT 3315, I E 4360.)

150 Management Information Systems.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320 MKT 3350 MGT 3373 ISQS 3343 ISQS 3347	ISQS 3344 BLAW 3391 ISQS 3346 ISQS 3348 Non-BA/non-Eco. elective -3 hours	MGT 3370 ECO 3311 ISQS 3349 ISQS 4348 Free elective-3 hours or enough to have total hours of 114+2 PF&W	MGT 4380 ISQS 4349 *ISQS 5342 *ISQS 5347

*Not included in the 114 (+2 PF&W) undergraduate hours required.

Upon satisfactory completion of the undergraduate requirements of 114 (+2 PF&W) hours and ISQS 5342 and 5347, the BBA degree will be awarded.

Marketing Major. (21 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. The five required marketing courses and the two major elective courses allow the breadth or depth in marketing and related subject areas.

5th Semester	6th Semester	7th Semester	8th Semester
MKT 3350 FIN 3320 MGT 3370, 3373 BLAW 3391	MKT 3352, 3356 ISQS 3344 Group A-3 hrs. Group B-3 hrs.	MKT 4354 3000-4000 level non-B.A., non-Eco. elect.-6 hrs. ECO 3311 Group A-3 hrs.	Group C-3 hrs. MGT 4380 3000-4000-level elect.-6 hrs. Free elective-If needed to complete 120 hrs. (+2 PF&W)

Group A—junior-senior marketing courses; Group B—junior-senior course in other area of B.A.; Group C—junior-senior non-B.A. course.

150 Marketing.

5th Semester	6th Semester	7th Semester	8th Semester
MKT 3350 FIN 3320 MGT 3370 BLAW 3391 MGT 3373	MKT 3352 ISQS 3344 MKT 3356 Group A-3 hrs. Group B-3 hrs.	MKT 4354 Group A-3 hrs. ECO 3311 Junior or senior non-BA/ non-Eco. electives-6 hrs.	MGT 4380 Group C-3 hrs. Free elective only if needed to have total hours of 114 + 2 PF&W *ISQS 5342 *ISQS 5347

*Not included in the 114 (+2 PF&W) undergraduate hours required.

Upon satisfactory completion of the undergraduate requirements of 114 (+ 2 PF&W) hours and ISQS 5342 and 5347, the BBA degree will be awarded.

Petroleum Land Management Major. (33 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. It is recommended strongly that PLM majors have at least a 2.60 GPA in GEOL 1303, 1101, 1304, 1102, ACCT 2300, 2301, ECO 2301, 2302, and ISQS 2445. An approved Geology course and GEOL 1303, 1101, 1304, 1102 should be taken in lower division and must be completed with a grade of C or higher.

5th Semester	6th Semester	7th Semester	8th Semester
FIN 3320 MKT 3350 MGT 3370, 3373 PETR 3301	ISQS 3344 ACCT 3307 BLAW 3391 MGT 3376 GEOG 3300 or 3303 or PALA 4403	ECO 3311 ACCT 4310 BLAW 3393 GEOL 4323 PALA 4303	MGT 4380 BLAW 3395 B A 4383 GEOL 4324 Elective if needed to complete 120 hrs. (+2 PF&W)

Prelaw Studies. Students interested in attending law school after graduation may pursue any of the regular programs offered.

Graduation Requirements

The Bachelor of Business Administration degree will be awarded to all students who fulfill the following minimum requirements:

1. Satisfactory completion of general education requirements, lower and upper division core, major courses, and free electives to reach minimum total hours.
2. A minimum cumulative 2.00 GPA in all courses attempted at Texas Tech (including repeated courses).
3. A minimum cumulative 2.00 GPA in all business administration courses attempted at Texas Tech (including repeated courses).
4. Completion of at least 45 hours of required major and core courses following official admission into the College of Business Administration.

Minor for Non-B.A. Students. The requirements for a minor for students in colleges other than Business Administration are as follows:

1. Lower division courses must be completed with a grade of C or higher before enrolling in any upper division courses.
2. A minimum 2.00 cumulative GPA on all courses attempted at Texas Tech, including repeated courses, is required.
3. All junior and senior level courses must be taken at Texas Tech.
Management (19 hours). Lower division—2445 and 2300; upper division—3370, 3376, and two from 3343, 3344, 3374, 3379, 4372, 4374, 4375, 4397.
Marketing (19 hours). Lower division—2445 and 2300; upper division—3350, 3352, 4351, and 4354.
General Business (22 hours). Lower division—2300, 2301, and 2445; upper division—3320, 3350, 3370, and either 3343 or 3344.

Nondegree Students. 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 Program Office. 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.

Admission of Transfer Students

Students planning to take their first two years of work at a junior or community college should follow our lower division degree plan. Up to one-half of the hours required in the degree program can be accepted provided none of the courses are vocational, career, or upper division courses.

Courses that are acceptable from a four-year institution are our lower division requirements and free electives for a total of up to 62 hours plus the following Upper Division Core: FIN 3320, ISQS 3344, MGT 3370, MKT 3350, BLAW 3391, and ECO 3311. The last 45 hours must be taken while registered in the College of Business Administration.

Students transferring from any institution must have a cumulative 2.50 GPA or higher on all hours taken at any college or university. Former Texas Tech business students returning as transfer students must have a 2.50 cumulative GPA on all work attempted at the other institution.

Courses with grades of D from another institution will not be accepted by the College of Business Administration but all grades will be used in determining GPA eligibility for transfer. Only free electives may be accepted on a pass-fail basis.

Transfer credit from foreign universities will be awarded on the basis of validating examinations.

Students requesting permission to transfer from another college at Texas Tech must have a 2.50 cumulative GPA or higher (including repeated courses) at Texas Tech and must bring a copy of all transcripts to the Undergraduate Program Office prior to being officially admitted to the College of Business Administration. A student is officially admitted to the college by a formal transfer completed by the Undergraduate Program Office. Upper division business and economics courses will be used in the degree program if (1) the student had a cumulative 2.00 GPA (in all work attempted at Texas Tech including repeated courses) when the courses were taken and (2) the B.B.A. lower division requirements had been completed.

The last 45 hours prior to graduation must be taken while enrolled in the College of Business Administration.

General Standards and Requirements

Accreditation. The American Assembly of Collegiate Schools of Business prescribes that at least 40 percent of the total hours required for graduation be in subjects other than business and upper level economics. The degree plans outlined on the preceding pages comply with this requirement.

Application for Graduation. At least one year before the proposed graduation date, application for the degree must be made through the Undergraduate Program Office. A diploma fee is paid to the Bursar and a copy of the

receipt brought to the Undergraduate Program Office when the degree application is submitted. Graduation is attained by fulfilling the requirements for a B.B.A. degree using an eligible catalog edition. It is the student's responsibility to fulfill all catalog requirements.

Application for Upper Division. Students seeking admission to the upper division should make application during preregistration.

Catalog Selection. Students will use the catalog issued for the year in which they were first officially admitted to the College of Business Administration or a more recent catalog if approved. However, if they later transfer 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. For these purposes, a catalog expires after seven years.

Correspondence Courses. Only free electives may be taken by correspondence. A correspondence course cannot be used for graduation when completed during the student's final semester or summer term.

Course Load. The normal course load for a semester is 15 to 16 hours. The maximum load for a semester is 17 hours (7 hours for a summer term). A student with at least a 3.00 cumulative GPA at Texas Tech may take 18 hours in a long semester. Correspondence courses are included in a student's course load. A maximum of 12 hours is recommended for students on probation.

Course Prerequisites. Prerequisites are governed by the catalog in effect when the course is taken.

Marketing. A grade of C or higher in MKT 3350 is a prerequisite for all other marketing courses.

ISQS. A 2.70 cumulative Tech GPA is required for taking ISQS 3348.

Accounting. In addition to the prerequisites in the course listing, the following also apply for ACCT 3305, 3306, 4301, 4302, 4303, 4304, 4306, 4307, 4308, and 4309:

1. Eligibility for upper division.

2. A minimum 2.60 cumulative GPA in ACCT 2300, 2301, and 3304. 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; a maximum of 15 hours in ACCT 2300, 2301, and 3304 will be allowed (i.e., two repeats); 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 transfer courses are used.

3. ACCT 3304 completed with a grade of C or higher.

4. A 2.70 cumulative GPA is required for taking ACCT 3305 and 3306.

Finance. A 2.70 cumulative Tech GPA is required for taking ACCT 3301 and FIN 3323.

Incomplete. Grades of Incomplete must be removed at Texas Tech University, not by transfer credit.

Ineligible Registrations. The College of Business Administration reserves the right to drop any ineligibly registered student from a course for reasons such as lower division-upper division rule infractions and lack of prerequisites. Courses taken ineligibly are not used in the degree program.

Non-Business Administration Students. Students in colleges other than Business Administration must have a 2.00 cumulative GPA or higher in all courses attempted at Texas Tech (including repeated courses) and at least 60 hours to be eligible for upper level (3000-4000) business courses.

Pass-Fail. Only free electives are eligible for the pass-fail option. No free elective 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, nor can a course be taken pass-fail that could be used for a group A, B, or C requirement unless that group has been satisfactorily completed. Pass-fail hours are excluded in determining eligibility for the Dean's Honor List.

Summer Work. Course work to be taken at other institutions should be discussed with an undergraduate program counselor.

Services

Counseling. Each undergraduate student in the College is provided with an academic counselor located in the Undergraduate Program Office on the second floor of the BA building. BA counselors have the expertise and capability to provide the necessary guidance during each student's degree program and are aided by a computerized degree audit to ensure accuracy. Lower division students are guided by counselors in the Undergraduate Program Office, and students are encouraged to visit with faculty advisors concerning their chosen 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.

Courses

Courses numbered 1000 and 2000 are lower division courses; those numbered 3000 and 4000 are upper division courses. Refer to preceding pages for eligibility to take upper level (3000-4000) courses.

Courses in Business Administration. (B A)

- 1390. Business Enterprise (3:3:0).** A study of the role and functions of business in society with an emphasis on business as a profession.
- 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 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.
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, nonaccounting major, and 2.70 Tech GPA. 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, FIN 3320, and 2.70 Tech GPA. 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 and Managerial Accounting (3:3:1)**. Prerequisite: ACCT 3304, ISQS 2445, and 2.70 Tech GPA. A study of principles and techniques of cost and managerial accounting for product costing, planning, control, and decision making.
3307. **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.
3315. **Accounting Systems (3:3:0)**. Prerequisite: ACCT 3304 or 3301. The theories, procedures, and techniques of accounting information systems for organizations.
4301. **Principles of Auditing (3:3:0)**. Prerequisite: ACCT 3305 and 3315. An introduction to the theory and practice of auditing. Auditor decision-making through a cycle approach to an audit engagement is emphasized.
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: ACCT 3305. In-depth discussion and analysis of selected topics in financial accounting. Broadens the students' knowledge of topics introduced in ACCT 3304 and 3305 and covers new topics as they emerge in practice. Concentrates on the applicability of important promulgated accounting standards.
4304. **Advanced Accounting Problems (3:3:0)**. Prerequisite: ACCT 3305. Accounting for corporate business combinations and the preparation of consolidated financial statements. The accounting and reporting problems associated with partnerships and foreign operations are also discussed.
4306. **Advanced Accounting Systems (3:3:0)**. Prerequisite: ACCT 4301. An analysis of the effects of information technology on the control and maintenance of accounting information systems.
4307. **Advanced Income Tax Accounting (3:3:0)**. Prerequisite: ACCT 3304 and 3307. Study of taxation of corporations, partnerships, estates, gifts, and trusts.
4308. **Advanced Auditing (3:3:0)**. Prerequisite: ACCT 4301. A study of advanced topics in audit theory, statistical sampling, and EDP technology. Emphasis is placed on case studies in governmental, internal, and external auditing.

- 4309. Advanced Cost and Managerial Accounting (3:3:0).** Prerequisite: ACCT 3306. A study of advanced cost and 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 2301, 2302, 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 2301 and 2302 or concurrent with ECO 2301 and a 2.70 Tech GPA. 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)
- 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.
- 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 position of an individual business firm in conducting international trade; procedures in financing international transactions.
- 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, ACCT 3301 and 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: FIN 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)**. Prerequisite: FIN 3332. 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, information systems, and business oriented computer use. Students gain hands-on exposure to word processing, spread sheets, databases, and BASIC programming.
2341. **Business Computer Programming (3:3:0)**. Prerequisite: ISQS 2340. 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 regression, and time series.
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 and Operations Management (3:3:0)**. Prerequisite: ISQS 2340 and 2445. An overview of the production and 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 is considered.
3346. **Advanced Application Programming Techniques (3:3:0)**. Prerequisite: 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.
3347. **Data Structures and Programming Languages (3:3:0)**. Prerequisite: ISQS 2341. Introduces students to a structured programming language. Introduces algorithmic analysis, string processing, recursion, data structures, file processing techniques, and bulk storage devices.
3348. **Database Management Systems (3:3:0)**. Prerequisite: ISQS 3347 and a 2.70 Tech GPA. Basic concepts of database management systems, recent developments in the area of database systems. Students develop a prototype database application of their own.
3349. **Introduction to Data Communication Systems (3:3:0)**. Prerequisite: ISQS 2341. Introduction to the concepts and terminology of data communications, network design, and distributed information systems. Emphasis on management of equipment, architectures, and transmission alternatives.
4343. **Management Science and Operations Research II (3:3:0)**. Prerequisite: ISQS 3343. The application of advanced quantitative tools to business problems.

- 4344. Production and 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 and operations function.
- 4348. Systems Analysis (3:3:0).** Prerequisite: ISQS 3348 (or concurrent enrollment). Methods for analyzing information needs and specifying application system requirements, the development life cycle and the life cycle phases leading to the determination of system requirements.
- 4349. Information Systems Design (3:3:0).** Prerequisite: ISQS 4348. Introduces the skills needed to develop a physical design and implement an operational system from the logical design of systems analysis.

Courses in Management. (MGT)

- 3370. Organization and Management (3:3:0).** The management function; basic principles, concepts, and practices in the operation of organizations.
- 3371. Entrepreneurship for Small Business (3:3:0).** Prerequisite: Junior standing or consent of instructor. Principles and practices of planning, starting, and operating a small-scale enterprise. Nonbusiness majors only.
- 3373. Managerial Communication (3:3:0).** Prerequisite: Business majors only and at least a C in ENGL 1301 and 1302. The application of oral and written communication principles to managerial situations; an overview, simulation, and analysis of the communication process in the business environment.
- 3374. Personnel Administration (3:3:0).** Principles and methods 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 settings.
- 3379. Advanced Organization and Management (3:3:0).** Prerequisite: MGT 3370. Study of the design and management of organizations in considerable depth beyond the basic course.
- 3396. Recent Employment Legislation (3:3:0).** Study of pertinent areas of activity in equal employment opportunity issues and labor relations, with particular emphasis on major federal laws. General Texas state employment legislation is included.
- 4370. Management of Small Business Enterprise (3:3:0).** Prerequisite: ACCT 2300, 2301, FIN 3320, MKT 3350, MGT 3370, 3373, BLAW 3391. Field experience in small business counseling involving problem solving and applications of business management principles.
- 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. 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 2301, 2302, 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 organizations.

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 2301 (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 and MKT 3350. 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.
4358. **International Marketing (3:3:0).** Prerequisite: MKT 3350. A survey of international marketing principles, cultural differences, world markets, and political constraints.
4359. **Sales Management (3:3:0).** Prerequisite: MKT 3350. Problems and methods of organization and administration of sales departments, sales operations, sales control, sales promotion, and sales policies.

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, partnership and corporation sales, with emphasis on subject matter appearing frequently in the CPA law examination.
3393. **Real Estate Law (3:3:0).** Rights in land; classification of estates; acquisition and creation of property rights; titles; and common conveyances.
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.

College of Education

Professor Charles W. Smith, *Dean*

The College of Education 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 certification programs for both undergraduate and graduate students who plan careers in education. For many individuals, this means a future in teaching. However, a variety of other degrees and certificates are available in such areas as administration, counselor education, curriculum and instruction, educational psychology, higher education, instructional technology, secretarial and office administration, and supervision. Furthermore, the College of Education prepares individuals to work with a variety of special populations, and at a variety of levels—early childhood, elementary, secondary, community colleges, and senior colleges and universities.

The general curricula for each undergraduate program are outlined in this section; graduate degree programs leading to the Master of Education degree, the Doctor of Education degree, and Teaching Certificates 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.

Due to recent changes in state laws, teacher education at Texas Tech has recently undergone many revisions. Majors using the term "Education" (e.g., Elementary Education, Art Education, Home Economics Education) are no longer allowable under that name. Individuals will still be certified to teach in elementary and secondary schools, but now must complete non-education majors.

Students preparing to teach in secondary schools will generally complete an academic major in Agricultural Sciences, Arts and Sciences, or Home Economics. (Additional courses in professional education will be required for certification.)

Students preparing to teach in elementary schools will complete a Multidisciplinary Studies major in the College of Education. Students interested in teaching composite science (certified to teach biology, chemistry, earth science, and physics) may complete a Multidisciplinary Science major in the College of Education, or an academic major in one of the teaching fields. The Hearing Impairment, and Office Systems Technology and Administration programs also reside in the College of Education.

General Education Requirements. The University had established general education requirements for all students. These requirements will ensure breadth in each academic program.

Students should consult their academic dean regarding specific general education course requirements. Students are urged to seek advisement prior to

their first enrollment to avoid losing credit. Students may also find a listing of General Education Requirements in the *Directory of Classes*.

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 is expected to have at least one individual conference each semester with an advisor during which the current semester's work will be evaluated and the next semester's plan will be developed.*

The academic 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) helping the student in selecting the proper areas of specialization and/or teaching fields, and (3) advising the student in meeting admission and retention standards of teacher education and student teaching. Either advisor or advisee may ask the Dean of the College of Education for a change in assignment.

Degree and Teaching Certification Programs. Degree and teacher certification programs are two distinct programs. Freshman or transfer students are admitted to a degree program in the College of Education that leads to a Bachelor of Science degree. Eligible students at the junior level are admitted to a teacher certification program that leads to a Texas teaching certificate. The certification program culminates with the state mandated ExCET exams. Students must pass all appropriate ExCET exams for certification, but not for the bachelor's degree.

Admission to the Bachelor of Science Degree Program. The College of Education seeks to maintain rigorous academic programs to produce outstanding educators for Texas and the nation. Admission to College of Education programs is open to all individuals on the basis of academic preparation, ability, and availability of space in the program selected. When there are more qualified applicants than can be adequately instructed by available faculty or accommodated in available facilities, the college may control enrollment in specific programs by limiting the admission of new students. Such factors as previous academic work (high school or college transfer credits), entrance examinations, letters of application, letters of reference, and personal interviews may be considered in the admission process.

Admission to the Teacher Certification (Education) Program. Admission to the College of Education does not insure admission to upper-division teacher certification and education programs. To be admitted to teacher certification programs, students must meet the following prerequisites:

(1) A minimum of 60 semester hours with an acceptable scholastic grade-point average. Students seeking elementary school certification (general elementary, bilingual, early childhood, or special education), must have a 2.70 or higher overall GPA. Students seeking all other certificates (business education, hearing impairment, secondary, and all-level), must have a 2.50 or higher overall GPA.

Furthermore, students must have a 2.50 GPA for the secondary teaching field(s) or the elementary area of specialization (including the "combination of subjects" and reading) and a 2.50 GPA for the professional education courses. No "D" grades are accepted for the area of specialization, teaching field(s) or professional education courses.

(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 demon-

strated proficiency at the fiftieth percentile or above on an English proficiency test administered by the University.

(3) A satisfactory level of performance on the Texas Academic Skills Program (TASP).

(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.

Admission to upper division teacher education programs may be subject to additional entrance criteria.

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 early childhood specialization will enroll in the College of Education or in the College of Home Economics; students seeking certification at the elementary school level will enroll in the College of Education; those interested in secondary school level 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 teaching field desired. Students planning to teach hearing-impaired children should enroll in the College of Education.

Office Systems Technology and Administration. This program is designed to provide courses at the undergraduate level leading to a Bachelor of Science degree in Office Systems Technology and Administration as well as to prepare graduates for professional secretarial and administrative office careers and for the Certified Professional Secretary (CPS) examination. The academic program can lead to certification in business education.

Academic Foundations. During the freshman and sophomore years the student normally completes the general education requirements for both the Bachelor of Science degree and, except for office systems technology and administration, 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 degree leading to elementary certification may begin an academic specialization in the freshman year. The student seeking the Bachelor of Science 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 (elementary) and the teaching field (secondary) must be completed prior to admission into student teaching.

Professional Education. The professional education sequence for certification 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 "Admission to the Teacher Certification Program."

Methods courses for initial certification programs include field experience in schools and are offered only when the elementary and secondary schools are in session.

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 department chairperson or associate dean. During the semester in which student teaching is taken, the maximum load is 12 semester hours.

Length of Degree Program. The Bachelor of Science degree can be completed within normal load limits in eight semesters. A student may 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. Students should complete a degree and certification plan no later than the second semester of the freshman year. Assistance in completing the degree and certification plan is found in 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.

Pass-Fail Option. Courses used to meet stated degree plan requirements may not be taken pass-fail. Up to 13 hours of courses that are taken as free electives to total 131 hours, and are not used to meet any other degree requirement, may be taken pass-fail. Courses that are designated pass-fail by departmental policy rather than student choice do not count in the 13 hour limit on elective courses that may be taken pass-fail. No student on probation is allowed the pass-fail option.

Department of Educational Leadership and Secondary Education

Professor Gerald D. Skoog, Chairperson.

Professors Ainsworth, Askins, Beckner, Gades, Hensley, Kelsey, Mehaffie, Reavis, Smith, and Sparkman; Associate Professors Bloomer, Carter, Christian, Denham, Ewalt, Kimmel, Mezack, Platten, and Purkerson; Assistant Professors Campbell, Everett, Kilchenstein, O'Hair, and Stephens; Adjunct Professor Cluff; Adjunct Associate Professor Garnett; Adjunct Assistant Professors Harris, Henry, and Logan; Instructor Clere; Lecturer Schreiber.

Programs in this department include secondary education, office systems technology and administration, higher education, and educational administration and supervision. Graduate programs in this department are described in the *Graduate Catalog*.

Due to changes in state law, it is not possible to major or earn a degree in Secondary Education. Individuals seeking certification to teach in grades 6-12 must complete a major in the desired area of certification, meet all baccalaureate requirements for that major, and the certification requirements listed in the Teacher Education section of this catalog.

The certification requirements include 18 hours in Education. The courses required are EPSY 3330, EDSE 3300, 3321, 4320 (or one of the following: EDSE 4351, 4360, 4376, 4380, 4381) and EDSE 4000 (6 hours). EDSE 3321, 4320, and 4000 are taken concurrently during a professional semester.

The Multidisciplinary Science major is administered in this department. Individuals completing this major, the baccalaureate requirements, and the certification requirements are eligible for certification to teach all sciences grades 6-12 in Texas. The major requires 57 to 61 semester hours in science. All

individuals in this major are required to complete CHEM 1103, 1104, 1307, and 1308, PHYS 1103, 1104, 1306, and 1307, GEOL 1101, 1102, 1303, and 1304, BIOL 1403 and 1404, ATMO 1300, and ASTR 1300 and 1100. In addition, an emphasis in either biology (20-22 semester hours), chemistry (18-20 semester hours), geosciences (20-22 semester hours), or physics (18-21 semester hours) is required. Students seeking certification must minor in secondary education. Students not seeking certification must have a minor in an area other than education.

The Office Systems Technology and Administration (OSTA) major prepares individuals for professional secretarial and administrative office careers. It also provides the foundation for a program leading to teacher certification in business education. The major requires a minimum of 120 hours of course work, consisting of 60 hours of general education (including electives), 30 hours of a business core, 24 hours of an office systems core and 6 hours of office systems and business electives. The business core is as follows: ACCT 2300, 2301, ECON 2301, 2302, FFP 3370, BLAW 3391, MGT 3370, 3373, 3374, and MKT 3350. The office systems core consists of OSTA 1337, 3337, 3338, 3339, 3340, 4338, 4339, and 4340.

Courses in Office Systems Technology and Administration. (OSTA)

The equivalent of OSTA 1237 is a year of typewriting instruction in high school or a semester of beginning typewriting at another college. The equivalent of OSTA 2337 is a year of high school shorthand or a semester of beginning shorthand at another college.

- 1237. Beginning Keyboarding (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: OSTA 1237 or equivalent. Continued keyboarding accuracy and speed 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 automating brief forms, fluent reading of shorthand, acquiring a basic shorthand vocabulary, and recording from familiar or correlated material.
- 2338. Shorthand Dictation and Transcription (3:3:2).** Prerequisite: OSTA 1337 or equivalent and 2337 or equivalent. Continued development of shorthand recording skill. Transcription of mailable office communications from shorthand notes recorded from unfamiliar dictation.
- 3337. Information Processing (3:3:2).** Investigation of word, voice, data, and image processing in the office environment. Experience with microcomputer business applications software.
- 3338. Word Processing (3:3:2).** Prerequisite: OSTA 1337 or minimum 40 wpm keystroking skill; and OSTA 3337, EDIT 2318, or ISQS 2340. Word processing concepts, equipment, personnel, and procedures. Supervisory techniques for the word processing function. Experience with basic and advanced functions of microcomputer word processing software.
- 3339. Control of Information Resources (3:3:0).** A study of the role and nature of office information and the procedures, personnel, and equipment necessary for its creation, maintenance, use, and disposition.
- 3340. Telecommunications for the Office (3:3:0).** Prerequisite: OSTA 3337. Information distribution technologies and systems for the internal and external data, text, voice, and image communications of an automated office.

4321. **Office Systems Programming (3:3:0)**. Prerequisite: OSTA 3337, EDIT 2318, or ISQS 2340. Introduction to computer programming applications in office administration. Employs PC-based systems and a common language such as BASIC. Emphasizes planning, problem-solving, and structured programming techniques.
4338. **Administrative Support Systems (3:3:0)**. Prerequisite: OSTA 3337 or EDIT 2318 or ISQS 2340. A study of the office administrative support system in facilitating improved managerial performance, including its organizational structure, procedures, personnel requirements, and hardware and software needs.
4339. **Administration of the Electronic Office (3:3:0)**. Prerequisite: OSTA 3337, 3338, 3339, 3340, 4338, and ACCT 2300. Principles of office automation, including planning, organizing, staffing, directing, and controlling the electronic office. Emphasis on office systems analysis and design techniques for automated offices.
4340. **Professional and Staff Development in Business and Industry (3:3:0)**. Prerequisite: OSTA 3337 and 3338. Techniques for developing and implementing professional and staff development programs within an organizational environment. Investigation of available learning aids appropriate for typical corporate training programs.

Courses in Business Education. (EDBE)

4380. **Methods of Teaching Business Subjects I (3:3:0)**. Prerequisite: ECO 2305. 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: OSTA 1337 or equivalent. Methods, content, and materials to teach courses in typewriting, shorthand transcription, COE/POE, secretarial procedures, and related courses.

Courses in Secondary Education. (EDSE)

1290. **Introduction to Professional Education (2:2:0)**. Introduction to the professional roles and skills of teachers, observation in a variety of classrooms, and review of degree and certification requirements and career opportunities.
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. Foundations of curriculum development, curriculum patterns, preparation of resource-teaching units, and issues in curriculum development. Field experiences required.
4000. **Student Teaching in the Secondary School (V1-12)**. Prerequisite: Attainment of admission standards to student teaching. Supervised teaching involving a period of major responsibility for instruction in an accredited secondary school.
4320. **Teaching in Secondary Schools (3:3:0)**. Prerequisite: Senior standing; EPSY 3330, EDSE 3321, or equivalents. Foundations of teaching, methods and techniques, evaluation and classroom management problems.
4321. **Designing Classroom Teaching and Management Strategies (3:3:0)**. Study of a variety of approaches for planning and teaching lessons of different types. Various classroom management strategies emphasized.

- 4351. Teaching Grammar, Composition, Spelling, and Listening (3:3:0).** Prerequisite: EDSE 3321 and EPSY 3330. Preparation for teaching grammar, usage, punctuation, composition, spelling, critical thinking, and listening in junior and senior high schools.
- 4352. Young Adult Literature (3:3:0).** Studies in young adult literature; analysis, criticism, selection, and use.
- 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. 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: EPSY 3330. 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; EPSY 3330. Focus on the curriculum, methods, and materials related to science instruction in the secondary schools.
- 4398. Senior Project in Secondary Education (3).** Senior standing and consent of instructor. Intensive planning and project development in preparation for student teaching or teaching internship.
- 4399. Individual Study (3).** Prerequisite: 9 hours of education and consent of instructor. Independent study focusing on curriculum development and teaching strategies.

Department of Educational Psychology, Special Education, and Instructional Technology

Professor Joe Cornett, Chairperson.

Professors Bensberg, Biggers, Candler, Peterson, Sowell, and Willingham; Associate Professors Bradley, Manley, Parr, Price, and Reid; Assistant Professors Kelley, Koenig, O'Dell, Repman, Strawderman, and Tallent; Instructor McMillan; Lecturers Davidson, Devenport, and Martin; Adjunct Associate Professor Irons; Adjunct Assistant Professors Arredondo, McGovern, Reavis, and Thompson.

The Department of Educational Psychology, Special Education, and Instructional Technology offers a wide variety of course work at the undergraduate level. In educational psychology, course work provides training for teacher certification in the fields of learning and tests and measurement, legal and ethical issues for teachers, and history and philosophy of education. The instructional technology program offers course work in audiovisual instruction, educational computing, and learning resources. Secondary certification is also available in computer information systems. The special education program offers certification in various areas of special education, including hearing impaired education, as well as a variety of course work to enhance certification in other programs in the college.

Courses in Educational Instructional Technology. (EDIT)

- 2318. **Computing and Information Technology (3:3:0)**. Use of computers as productivity tools, societal and ethical implications of computers, and applications of computers and related technology in society.
- 3132. **Introduction to Audiovisual Education (1:1:0)**. Overview of instructional media and technology, with practical application to classroom teaching. Includes production of audiovisual materials and operation of classroom equipment.
- 4318. **Advanced Applications of Computers in Education (3:3:0)**. Prerequisite: EDIT 2318 or consent of instructor. Educational computing applications for specific curriculum areas such as math, science, reading, and social science as well as use of the computer for classroom recordkeeping.
- 4323. **Production and Use of Instructional Media (3:3:1)**. An introductory course on production and use of instructional materials including video and instructional photography.
- 4099. **Individual Study in Educational Technology (V1-3)**. Prerequisite: EDIT 2318 or consent of instructor. Independent study focusing on educational technology. May involve tutorial work.

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.
- 4357. **Guidance Studies IV (3:3:0)**. Introduction to techniques of working with students, teachers, counselors, and parents.
- 4359. **Student Personnel Staff and Resident Student Development (3:3:0)**. 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.
- 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)

- 2000. **Introductory Experiences with Handicapped Children (V1-3)**. Supervised practicum of pre-student teaching experiences with handicapped children in settings where the state curriculum is being used.
- 2301. **A Beginning Course in American Sign Language (3:3:0)**. Prerequisite: Sophomore standing. An introduction to American sign language with an emphasis on sign vocabulary and American Sign Language Syntax. Receptive skills are stressed.
- 2302. **An Intermediate Course in American Sign Language (3:3:0)**. Prerequisite: EDSP 2301 or equivalent proficiency. Continuation of EDSP 2301—an emphasis on sign vocabulary and American Sign Language Syntax. Receptive skills are stressed.
- 3131. **Teaching Exceptional Students (1:1:0)**. Characteristics of exceptional students, assessment, and provision for least restrictive alternative environments.
- 3300. **Characteristics of Exceptional Persons (3:3:0)**. An overview of the characteristics of each of the major handicapping conditions and the implications for the integration of individuals as fully participating citizens of the United States.
- 3301. **Advanced American Sign and Preferred Sign Language (3:3:0)**. Prerequisite: EDSP 2302. American Sign Language idioms and an introduction to Preferred Sign Language, emphasizing receptive and expressive skills.

- 3350. Foundation in the Education of the Hearing Impaired (3:3:0).** Examination of the sociological, and communication characteristics of the hearing impaired population. Includes an overview of the history and philosophies of educating the hearing impaired.
- 3351. Hearing Impaired: Professional Service Delivery (3:3:0).** Prerequisite: EDSP 3350. Trends, issues, principles, and practices in professional service delivery to hearing impaired children. Includes P.L. 94-142, ARD-IEP, parent intervention, curricula, and mainstreaming.
- 3353. Speech Development for Hearing-Impaired Students (3:2:1).** Prerequisite: Junior standing. Analysis of speech production in hearing impaired: readiness, voice, breath, articulation, rhythm, phrasing, accent, and fluency.
- 3354. Language Development of the Young Hearing-Impaired Child (3:3:0).** Prerequisite: Junior standing. Examination of language acquisition, assessment, and intervention strategies young (birth-six years) the hearing impaired children. Includes parent-infant intervention.
- 3371. Alternatives for Intervention (3:3:0).** An introduction to each of the perspectives of the theories of management for handicapped individuals in home, school, and society.
- 4000. Student Teaching in Special Education (VI-12).** Prerequisite: Attainment of admission standards to student teaching. Supervised teaching involving a period of major responsibility for instruction and learning in a special education class of an accredited school.
- 4320. Education of the Exceptional Student (3:3:0).** Adaptation of curriculum, methods and materials to the specific needs of the exceptional student.
- 4332. Program Adaptations for Handicapped Persons (3:3:0).** Analysis of procedures and techniques for assisting the handicapped person in functioning in the total environment.
- 4355. Language Development of the Older Hearing-Impaired Child (3:3:0).** Corequisite: EDSP 4356. Processes and practices associated with facilitating language development for hearing-impaired children (seven years and older) in school programs.
- 4356. Developing Literacy in Hearing-Impaired Students (3:2:1).** Corequisite: EDSP 4355. Examination of literacy acquisition in children, including theoretical knowledge and strategies needed to facilitate literacy in hearing-impaired students.
- 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.
- 4380. 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.
- 4670. Hearing Impaired: Externship (6).** Prerequisite: Completion of all course work; concurrent enrollment in EDSE 4000. Supervised teaching experience with hearing impaired children and youth.

Department of Elementary, Bilingual, and Reading Education

Professor Lee Little Soldier, Chairperson.
 Professors Crowder, Nevius, Rooze, and Welton; Associate Professors Butler, Filgo, Geer, Hovey, Koeller, Lawrence, Ronshausen and Taylor; Assistant Professors Campbell, Howard, Miller, O'Hair, and Swafford; Lecturers Bobo and Daniels; Adjunct Associate Professor Garcia.

Several programs of study in this department are available that provide for diverse interests of students. One program leads to certification. The certificate course of study is identified as Option II (elementary). It is important that an advisor be consulted before the program is begun.

All of the programs of study include field experiences in pre-student-teaching settings, since much of the course work is conducted on site at various elementary schools. The intention is to give some very practical experience to prospective teachers.

Courses in Bilingual Education. (EDBL)

- 2190. **Projects in Multicultural Education (1:0:2).** Field experience in social agencies and other community settings.
- 3030. **Practicum in Bilingual Education and English as a Second Language (ESL) (V1-3).** Experience and observation in bilingual education, programs at K-12 levels, and adult education.
- 3133. **Sociocultural Considerations for Teaching (1:1:0).** Overview of sociocultural considerations in teaching.
- 3332. **Foundations of Bilingual Studies (3:3:0).** Overview of history, philosophy, assessment processes, research, and legal aspects 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.
- 3334. **Dual Language and Cognitive Development in Bilingual Programs (3:3:0).** Prerequisite: EDBL 3332. Skills, attitudes, psycholinguistic knowledge related to first and second language acquisition.
- 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.

Courses in Early Childhood Education. (EDEC)

- 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.
- 3308. **Early Childhood Education: Its History and Philosophy (3:3:0).** Early childhood education as viewed historically by Western civilizations.
- 3310. **Teaching Learning Processes for Young Children (3:3:0).** Prerequisite: Junior standing. Implications of teaching and the learning processes of young children for early childhood education.
- 4000. **Student Teaching in the Kindergarten (V1-12).** Prerequisite: Attainment of admission standards to student teaching. Supervised teaching involving a period of major responsibility for instruction and learning in an early childhood classroom of an accredited school.
- 4310. **Language and Young Children (3:3:0).** Role of early childhood education in developing adequate verbal communication skills.

Courses in Elementary Education. (EDEL)

- 1290. **Introduction to Professional Education (2:2:0).** Introduction to the professional roles and skills of teachers, observation in a variety of classrooms, and review of degree and certification requirements and career opportunities.
- 2191. **Projects in Elementary Education (1:0:2).** Exploratory experiences in educational programs through the elementary school level. May be repeated for credit.

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- 3391. 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.
- 3301. Instructional Planning in the Elementary School (3:3:0).** Prerequisite: Junior standing; and admission to the teacher education program. Principles of planning and instruction as they apply to the elementary school curriculum.
- 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.
- 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.
- 4000. Student Teaching in the Elementary School (V1-12).** Prerequisite: Attainment of admission standards to student teaching. Supervised teaching involving a period of major responsibility for instruction and learning in an elementary classroom of an accredited school.
- 4199. Independent Study (1).** Prerequisite: Senior standing and consent of instructor. Independent study of special aspects or topics of elementary education. May be repeated for up to 3 hours credit.
- 4301. Curriculum and Instruction in Elementary Education I (3:3:3).** Prerequisite: EDEL 3301; corequisite: EDEL 4000, 4302. Structure and organization of content, materials, and instructional strategies in the elementary school.
- 4302. Curriculum and Instruction in Elementary Education II (3:3:3).** Prerequisite: EDEL 3301; corequisite: EDEL 4000, 4301. Application of content, materials, and instructional strategies in the elementary school.
- 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.
- 4381. Instructional Management (3:3:0).** Prerequisite: Concurrent with student teaching. Specifically designed to include instructional methods and practical strategies that emphasize teaching learning process, planning, evaluation, and basic principles and procedures of classroom management.

Courses in Multidisciplinary Studies. (MD S)

- 3333. Integrative Multicultural Studies (3:3:0).** Prerequisite: Junior standing. An integrative multicultural focus on the impact of the processes of assimilation and cultural pluralism on educational institutions of America.

Courses in Reading Education. (EDRD)

- 0301. Developmental Reading (3:1:4).** Focuses on strategies for becoming a more effective, efficient reader. Does not apply for credit toward completion of any degree requirements.

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.
4342. **Evaluation of Reading Performance (3:3:0).** Prerequisite: EDRD 3340, 3341, or consent of instructor. Basic principles of evaluation applied to reading performance.
4343. **Linguistics in Reading Instruction (3:3:0).** Prerequisite: EDRD 3340, 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: EDRD 3340, 3341, or consent of instructor. Prepares students to work with the basal, language experience, and individualized reading approaches.
4345. **Reading Practicum (3:1:4).** Prerequisite: EDRD 3340, 3341, and 4342 or consent of instructor. Work with school-aged children in a tutorial role.



College of Engineering

Professor Mason H. Somerville, *Dean*

Engineering involves the application of scientific 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. Humanity's advancement is the common objective of each segment within the college: computer science, engineering, and technology.

Each academic program includes education in the basic sciences, mathematics, humanities, social sciences, and a technical application in solving some of humanity's problems.

The following Bachelor of Science degree programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc.: Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Physics, Industrial Engineering, Mechanical Engineering, and Petroleum Engineering. The three technology programs—Construction, Electrical-Electronics, and Mechanical—lead to a Bachelor of Science in Technology degree and are accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, Inc.

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 education 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.

A degree in Computer Science is offered by the Computer Science section, a recently established program that supports teaching and learning in the areas of languages, systems, hardware, software, and related studies. Graduates are prepared to continue their formal study or work in a variety of industries.

The program leading to the degree of Bachelor of Science in 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. A technology program leads to a terminal occupational degree preparing students for technical careers in such fields as applied design, construction, operations, maintenance, quality control, or sales. Prospective students should make inquiry concerning requirements, opportunities, and limitations of the technology programs. Curricula outlines and course descriptions are given in this catalog under the Department of Technology.

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.

The College of Engineering Mentor Program is available to any student, regardless of major, to discuss any aspect of his or her choice of career field, academic program, or academic progress. Although the student must make the final decisions, the mentor will provide enough guidance to assure that the student considers appropriate alternatives. The mentor uses advising and counseling skills which include: (1) gathering information about students; (2) listening to what the student is feeling; (3) advising and reflecting to the student; (4) referring the student, if necessary; and (5) caring for the student beyond his or her potential as an engineer.

The Allen Engineering Communications Center provides assistance to all engineering students and faculty in the areas of written and oral communication. Engineering faculty may refer students to the center, or students may make their own appointments. The center's staff tutors students in writing skills through grammar exercises, answering specific questions about writing, and reviewing sections of student writing and making suggestions for improvement. The center staff also lectures to classes on writing skills. For the faculty, the center provides a marking service which marks English usage in student papers.

Dual Degree Program. The College of Engineering has arranged with several other colleges and universities to provide students with the opportunity to earn dual degrees. The dual degree program enables a student to study approximately three years at one of several private institutions, earning credit for non-engineering courses. Generally, students can complete the course of study at Texas Tech within two full calendar years. Upon completing specific requirements, degrees are awarded by both institutions. Schools participating in the program include Lubbock Christian University, McMurry College, Our Lady of the Lake University, Wayland Baptist University, and West Texas State University.

Students from junior colleges generally transfer courses in English, history, political science, mathematics, and science. Junior colleges that adequately prepare students to study engineering have designated cooperative faculty who function as liaisons between their schools and the College of Engineering. Such cooperative arrangements provide students an opportunity to choose courses at the junior college that are required by a specific discipline in the College of Engineering. Problems in transferring to Texas Tech are minimized by the student's early commitment to transfer to the College of

Engineering. Schools having signed articulation agreements with the College of Engineering include Amarillo College, Clarendon College, Frank Phillips College, Midland College, and South Plains College.

General Education Requirements. The University has established general education requirements for all students. These requirements will ensure breadth in each academic program.

Students should consult their academic dean regarding specific general education course requirements. Students are urged to seek advisement prior to their first enrollment to avoid losing credit. Students also will find a listing of General Education Requirements in the *Directory of Classes*.

Undergraduate Degrees. The College of Engineering offers the following 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. An independent program leads to the Bachelor of Science degree with a major in computer science. Technology curricula with specialization in construction, electrical-electronics, and mechanical technology lead to the degree of Bachelor of Science in Technology. A cooperative program between the colleges of Engineering and Architecture leads to a degree from both entities. The Civil Engineering Department coordinates the program for the College of 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 needing prerequisite mathematics.

2. Each department administers a Dynamic Enrollment Management Plan (DEMP). With minor procedural differences between departments, the DEMP consists of three phases of general admission, preliminary admission to a degree program, and the degree program. The initial phase consists of approximately the first three full semesters of a department's recommended

sequence. The second phase is different for each department and is approximately the fourth semester of the department's program. The final phase consists of the last four semesters of a program.

The student moves from the entry phase by earning C's or better in all courses and successfully petitioning the department of choice. A student enters the third phase by successfully completing the second phase, petitioning the third phase, and meeting the minimum grade-point average (GPA) announced in each department.

Since the first three semesters of each engineering program are similar, it is possible for the student to attempt more than one department's second phase courses. Basically, students who earn grades of C or better can succeed in most programs. The minimum cumulative grade-point average for graduation is 2.00. Detailed guidelines and other limitations related to the Dynamic Enrollment Management Plan are available in each departmental office.

3. 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.

4. 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.

5. 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.

6. With the approval of a student's major department chairperson, 3 hours of the advanced ROTC credits may be counted for the general elective courses in the engineering and engineering technology degrees.

7. 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.

8. 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 by examination must be earned in freshman and sophomore courses before the student attains junior classification.

Credit for some courses above the freshman level is available through departmentally prepared examinations but students must present to the academic dean 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.

9. A student must file an "Application for Degree" (a senior letter) 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 credit hours and 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. The student must regain admission to enter the new program.

11. A candidate for a degree in the College of Engineering should file a Personnel Data Form with the Placement Service.

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 students with an inadequate preparation in mathematics or deficiencies in College of Engineering entrance requirements will be required to complete MATH 1320, College Algebra, and/or MATH 1321, Trigonometry, introductory chemistry or physics, in addition to the courses shown in the departmental curriculum. To remove such deficiencies, the student should attend summer school before the first long session.

Engineering students who need algebra, trigonometry, or science but who are unable to take advantage of summer school, should schedule the following:

Alternate Freshman Year for Engineering Students.

<i>Fall</i>		<i>Spring</i>	
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	PHYS 1303, Phys. for nonsci. majors	3
CHEM 1301, Intro. Chem.	3	HIST 2300, Hist. of U.S. to 1877	3
P.E., Band, ROTC, or Nutr.		P.E., Band, ROTC, or Nutr.	
	15*		15*

SUMMER SESSION

<i>First Term</i>		<i>Second Term</i>
MATH 1351, Calc. I	3	MATH 1352, Calc. II 3

*Exclusive of P.E., Band, ROTC, or Nutr.

Similar adjustment to compensate for deficiencies in recommended admission requirements can be made in the freshman programs in technology.

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 in the Office of the Dean of Engineering 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., Marching 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.

Foreign Students. Because of the large number 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 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.

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, to Master of Science degrees in agricultural engineering and in petroleum 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, Borger, and Midland.

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

Professor John Borrelli, Chairperson.

Professor Gregory, Associate Professors Dvoracek and Fedler.

This department supervises the following degree programs: AGRICULTURAL ENGINEERING, *Bachelor of Science in Agricultural Engineering* and *Master of Science in Agricultural Engineering*.

Agricultural engineering is the profession that bridges two important fields—engineering and agriculture. It serves the food and fiber production industry and related fields such as water resources development, land-use planning, and energy management. Agricultural engineers are concerned with soil conservation, proper use of water, efficient machine systems, and processes that maximize food and fiber production. Energy-efficient, cost-efficient production systems are essential in the agriculture industry. Agricultural engineers rely on the power of computers and use modern science to solve the problems facing the industry. Solutions take into consideration the maintenance of environmental quality as well as the efficient use of resources.

Agricultural Engineering Curriculum.

FIRST YEAR			
Fall		Spring	
AGEN 1301, Engr. Analysis	3	C S 1302, Intro. Prog. FORTRAN	3
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	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
POLS 1301, Amer. Govt., Org.	3	CTEC 2301, Surveying & Surveys	3
P.E., Band, ROTC, or Nutr.		P.E., Band, ROTC, or Nutr.	
	16		16
SECOND YEAR			
Fall		Spring	
AGEN 2302, Agri. Engr. Prin.	3	COMS 3308, Bus. & Prof. Speech	3
MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
AGRO 2321, Crop Gro. & Cul.	3	C E 2301, Statics	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. Pub. Pol.	3	AGRO 2432, Prin. & Prac. Soils	4
	16		17

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
AGEN 3301, Prin. Ag. Mach.	3	AGEN 3302, Ag. & Engr. Matls.	3
AGEN 3303, Irrig. Prin.	3	AGEN 3304, Env. Dsg. Agr. Struct.	3
CE 3302, Dynamics	3	CE 3303, Mech. of Solids	3
CE 3305, Mech. of Fluids	3	EE 2303, Elec. Sys. Anal.	3
ME 3321, Thermodynamics	3	IE 3322, Engr. Eco. Anal.	3
MATH 3350, Math for Engrs. I	3	**Technical elective 3	
	<u>18</u>		<u>18</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
AGEN 4301, Engr. Soil & Water Cons.	3	AGEN 4307, Irr. Sys. Design	3
AGEN 4306, Ag. Proc. Sys.	3	AGEN 4309, Senior Design	3
CE 3321, Intro. Geotech. Engr.	3	HIST 2301, Hist. of U.S. since 1877	3
CE 3121, Geotech. Engr. Lab.	1	**Technical elective 3	
HIST 2300, Hist. of U.S. to 1877	3	†General elective	3
*Math. elective	2	Humanities-fine arts 3	
††Humanities-fine arts	3		<u>18</u>
	<u>18</u>		

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutr.—137.

*Math. elective can be either MATH 4310 or IE 3340.

**Technical electives must be selected from 3000- or 4000-level engineering courses. Prior approval is needed from department chairperson for any 2000-level courses.

†General electives are enrichment courses and must be approved by the faculty advisor.

††At least one of the humanities-fine arts courses must be upper division.

Courses in Agricultural Engineering. (AGEN)

1301. **Agricultural Engineering Analysis and Design Concepts (3:3:0).** The profession of agricultural engineering and its relation to synthesis and analysis of typical agricultural engineering problems.
2301. **Engineering Instrumentation and Control Systems (3:2:3).** Corequisite: PHYS 1308 and 1106. 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.
2302. **Agricultural Engineering Systems Principles (3:3:0).** Prerequisite: AGEN 1301. Introduction into the principles and design consideration required for agricultural engineering systems in irrigation, power and machinery, processing, etc.
3301. **Principles of Agricultural Machinery (3:2:3).** Corequisite: CE 3302 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 (3:3:0).** Prerequisite: CE 2301 and chemistry and physics. Introduction to engineering and agricultural materials; metals, woods, polymers, grains, fibers, and control; uses of materials.
3303. **Irrigation Design Principles (3:3:0).** Prerequisite: CE 3305 or consent of instructor. Basic principles of irrigation to include soil moisture, evapotranspiration, water quality, efficiencies, design of ground water and irrigation pumping systems.
3304. **Environmental and Functional Design for Biological Systems (3:3:0).** Prerequisite: ME 3321. Biological response of plants and animals to environment. Engineering analysis and design of environmental structures; including heating, cooling, lighting, ventilation, and humidity.
3305. **Drainage of Agricultural Lands (3:3:0).** Prerequisite: CE 3305. Origin and nature of drainage problems in agricultural lands; drainage theories; design of surface and subsurface drainage systems; land reclamation; leaching requirements; drainage law.

- 3306. Electricity and Electronics for Biological Systems (3:2:3).** Prerequisite: E E 2303. Advanced design of electrical distribution systems, motor applications, and electronic controls with special applications to the agricultural industry.
- 4000. Agricultural Engineering Problems (V1-6).** Individual investigations of a technical or design problem. Systematic retrieval, research, and a final written report.
- 4301. Engineering for Soil and Water Conservation (3:2:3).** Prerequisite: C E 3305. Engineering aspects and design of soil and water conservation structures; including terraces, diversions, drops, chutes, spillways, drainage systems, earthen dams, and runoff determination.
- 4305. Design of Wood Structures (3:3:0).** Prerequisite: C E 3303, MATH 3350. Structural design of buildings using wood members. Includes engineering properties of wood and typical fasteners for the analysis of loads and stress analysis on beams, columns, and other framing members.
- 4306. Agricultural Processing Systems (3:2:3).** Prerequisite: C E 3305. Engineering principles in agricultural product conveyance, processing, and storage. Includes materials handling, treatment, and packaging of fibers, feeds, and food.
- 4307. Design of Irrigation Systems (3:2:3).** Prerequisite: AGEN 3303. Design of surface, sprinkler, and drip irrigation systems with special consideration given to spatial variability and hydraulic transients.
- 4309. Agricultural Engineering Design (3:1:5).** Prerequisite: Senior standing. Introduction to engineering design through team solution of design problems, major design principles, and preparation of design proposals. Critical evaluation of results by students, staff, and industrial representatives.

Department of Chemical Engineering

Professor Raghu S. Narayan, Chairperson; Associate Professor Hubert R. Heichelheim, Assistant Chairperson.
Professors Bethea, Bradford, Mann, Parker, Riggs, and Tock; Associate Professors Desrosiers and Rhinehart; Assistant Professor 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.

A minor in chemical engineering consists of 18 or more hours in chemical engineering courses, including CHE 1311, 2311, 3321, 3322, and 3440. Prerequisites for all of these courses will be enforced.

The profession of chemical engineering combines the principles of the physical and chemical sciences with the discipline of engineering to solve modern technological problems, and be of effective service to society. The chemical engineer is largely responsible for the continual development of new processes and new products that have a direct impact at improving the quality of life and the environment.

To this end, the Department of Chemical Engineering provides a broad-based program with individual academic counseling. This environment enables the students to develop their intellectual capabilities and interests as fully as possible.

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, petroleum refining, petroleum

production, plastics production, basic chemicals, petrochemicals, pharmaceuticals, metal production, textiles, semiconductors, and various biomedical and biological specialties. Many chemical engineers also are directly involved in the design of systems to minimize pollution of our environment or are active with governmental regulatory agencies which set environmental standards.

Continuing advances in the practice of chemical engineering include extensive use of computer simulation and computer control of chemical processes. The Department of Chemical Engineering at Texas Tech has well-established programs in both of these areas.

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 as part of academic course work.

In accord with the Dynamic Enrollment Management Plan of the College of Engineering, the progress of each chemical engineering student is carefully monitored to ensure that all prerequisites for upper-level courses are satisfied, and that degree requirements will be met in a timely manner. A grade of C or higher is required in any course applied toward the B.S. Ch.E. degree.

Students transferring into this department from other institutions or from another department at Texas Tech must have an overall grade-point average of 2.60 or better, as well as a grade-point average of 2.60 or better in all science, mathematics, and engineering courses. All grades assigned in the matriculation of these courses will be included in the computation of grade-point averages.

In addition to scholarships offered through the University Financial Aids Office and the College of Engineering, the Chemical Engineering Department also offers scholarships to qualified students. The awards are based on consistent academic performance of maintaining a GPA of 3.00 (on a 4.00 scale) or better.

Specification of prerequisites implies all prior prerequisites must have been met.

Chemical Engineering Curriculum.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
ENGL 1301, Ess. Coll. Rhetoric	3	MATH 1352, Cal. II	3
*MATH 1351, Cal. I	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. & Des.	3	CH E 1311, Intro. to Chem. Proc.	3
†CH E 1121, Freshman Seminar	1	†CH E 1121, Freshman Seminar	1
**Soc. Sci.—Humanities	3	**Soc. Sci.—Humanities	3
P.E., Band, ROTC, or Nutr.		P.E., Band, ROTC, or Nutr.	

SECOND YEAR

Fall		Spring	
MATH 2350, Calc. III	3	MATH 3350, Adv. Math. for Engr. I	3
CHEM 3105 & 3305, Org. Chem. I	4	PHYS 2301 & 1106, Prin. of Phys. II	4
C E 2301, Statics	3	CH E 3321, Chem. Engr. Thermo. I	3
CH E 2311, Process Principles	3	CH E 2343, Num. Sol. Chem. Eng. Probs.	3
##PHYS 1308 & 1105, Prin. of Phys. I	4	††Advanced chem. elect.	4
	17		17

THIRD YEAR

Fall		Spring	
CHEM 3107 & 3307, Phys. Chem. I	4	CH E 3306, Expos. Tech. Info.	3
E E 2303, Elec. Sys. Anal.	3	CH E 3330, Engr. Matls. Science	3
CH E 3322, Chem. Engr. Thermo. II	3	CH E 3441, Mass-Trans. Operations	4
CH E 4343, Engr. Experiment.	3	CH E 4323, Chem. Reactor Engr.	3
CH E 3440, Transport Processes	4	††Advanced Chem. Elect.	4
	17		17

FOURTH YEAR

Fall		Spring	
CH E 4232, Unit Oper. Lab. I	2	CH E 4232, Unit Oper. Lab. II	2
CH E 4353, Process Control	3	CH E 4355, Chem. Proc. Des. & Sim.	3
CH E 4354, Chem. Engr. Plant Des.	3	CH E 4153, Process Control Lab.	1
CH E 4121, Chem. Engr. Seminar	1	Elective	3
Elective	3	**Soc. Sci.-Humanities	9
**Soc. Sci.-Humanities	6		18
	18		

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutr.-138.

*Students who are not adequately prepared for calculus must take appropriate courses (MATH 0301, 0302, 1320, 1321, 1350) before enrolling in MATH 1351.

+Students who have not had high school chemistry must take CHEM 1301 before enrolling in CHEM 1307.

†Enrollment required every semester until completion of CH E 1311.

#Exclusive of P.E., Band, ROTC, or Nutrition.

##Students who have not had high school physics must take PHYS 1304 before enrolling in PHYS 1308.

††Must be taken from approved junior or senior-level chemistry courses.

**Social Sciences-humanities must include 6 semester hours of American History, 6 hours of American government or approved equivalent, 6 hours of fine arts and/or humanities, and 3 hours of individual or group behavior.

Courses in Chemical Engineering. (CH E)

- 1121. Freshman Seminar in Chemical Engineering (1:1:0).** Selected readings and small-group discussion of the chemical engineering profession; requirements, responsibilities, ethics, opportunities, history, personalities, types of companies.
- 1305. Engineering Analysis I (3:3:0).** Corequisite: MATH 1350. The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. Word processing, spreadsheet and compiler programming. Synthesis and analysis of typical engineering problems.
- 1311. Introduction to Chemical Processing (3:3:0).** Prerequisite: CH E 1305; corequisite: MATH 1352, CHEM 1308, CH E 1121, ENGL 1302. Dimensions, units and conversions, process variables, processing modules, simple material balances, flow-sheeting.
- 2311. Chemical Process Principles (3:3:0).** Prerequisite: CH E 1311; corequisite: MATH 2350, PHYS 1308. Integrated processing modules; complex material balances; energy balances, simple equilibrium relations, elementary transient balances.
- 2343. Numerical Techniques for Solutions of Chemical Engineering Problems (3:3:0).** Corequisite: MATH 3350. Introduction to numerical methods for integration, root finding, algebraic systems, optimization, initial and boundary-value problems.

3306. **Exposition of Technical Information (3:1:6).** Prerequisite: ENGL 1302, junior standing. Organization and presentation of derivations, equations, experimental data, and research conclusions. Computer-aided preparation of tables, graphs, and equations.
3321. **Chemical Engineering Thermodynamics I (3:3:0).** Prerequisite: CH E 2311 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, compressible flow, refrigeration, and liquefaction.
3322. **Chemical Engineering Thermodynamics II (3:3:0).** Prerequisite: CH E 3321; corequisite: MATH 3350. Solution thermodynamics, phase and chemical equilibria, 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 2311; corequisite: MATH 3350, CH E 3321, C E 2301, 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.
3440. **Transport Processes (4:4:2).** Prerequisite: C E 2301, CH E 2311, 2343. Unified principles of energy, mass, and momentum transport. Application to heat conduction, diffusion, fluid flow, and heat exchanger design.
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 3322, 3440. 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 3441, 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, 3440. 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.
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 3441, 4323. 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 3441, 4323, 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.

Department of Civil Engineering

Professor Warren K. Wray, Chairperson.

Professors Claborn, Kiesling, McDonald, Mehta, Smith, Sweazy, Urban, and Vallabhan; Associate Professors Keho, Norville, Ramsey, and Vann; Assistant Professor Rainwater; Visiting Professor Das; Visiting Assistant Professor Mollhagen.

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 graduates who are sensitive and alert to the needs of society, who have developed a professional engineering outlook, and who are equipped with the technical competence and creativeness to improve the quality of life for all within their spheres of influence. A student graduating with a degree in civil engineering will possess competence in several areas of the broad field of civil engineering.

The Civil Engineering Department supports the concept of the Dynamic Enrollment Management Plan and has adopted the following version of it. Prior to the third year of the curriculum shown below and before enrolling in subsequent civil engineering courses, each student must file an application for admission to the civil engineering degree program by submitting a degree plan. To gain admission to the degree program and to obtain approval of the degree plan, the student must maintain a grade-point average of 2.00 or higher in required courses, counting all attempts, in each of the following subject areas: mathematics, basic sciences, humanities-social studies, and engineering sciences. Departmental approval of a student's written request will be required for a grade of D to be accepted and enrollment allowed in subsequent courses having the course as a prerequisite. To graduate, the student must maintain the above standards in subsequent courses, complete specified minimum number of hours in each of these subject areas, and have a minimum overall GPA of 2.00. Changes in the degree plan or exceptions to the above stated conditions require written approval of the chairperson of the Civil Engineering Department. Forms and information pertaining to departmental regulations are available in the Civil Engineering Department office.

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 College of Architecture section of this catalog.

Civil Engineering Curriculum.

FIRST YEAR*

<i>Fall</i>		<i>Spring</i>	
MATH 1351, Calc. I	3	MATH 1352, Calc. II 3	
ENGL 1301, Ess. Coll. Rhetoric	3	C E 2101, Construction Matls.	1
C E 1305, Engr. Anal. I	3	**C E 1130, Civil Engr. Seminar I	1
C E 1130, Civil Engr. Seminar I	1	ENGL 1302, Adv. Coll. Rhetoric	3
EGR 1306, Engr. Graphics	3	CTEC 2301, Surveying	3
CHEM 1307, Prin. of Chem. I	3	HIST 2300, Hist. of U.S. to 1877	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	CHEM 1308, Prin. of Chem. II	3
P.E., Marching Band, or ROTC		CHEM 1104, Prin. of Chem. II (Lab.)	1
	<u>17</u>	P.E., Marching Band, or ROTC	
			<u>18</u>

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
MATH 2350, Calc. III	3	MATH 3350, Math. for Engrs. I	3
PHYS 1308, Prin. of Phys. I	3	C E 3210, Proc. Prob. Anal. II	2
PHYS 1105, Prin. of Phys. I (Lab.)	1	C E 3303, Mech. of Solids	3
C E 2210, Proc. Prob. Anal. I	2	C E 3103, Mech. of Solids Lab.	1
C E 2301, Statics	3	C E 3305, Mech. of Fluids	3
HIST 2301, Hist. of U.S. since 1877	3	POLS 2302, Amer. Pub. Pol.	3
POLS 1301, Amer. Govt., Org.	3	†ENGL 2309 or 3365	3
	<u>18</u>		<u>18</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
C E 3440, Struc. Anal. I	4	C E 3372, Water Sys. Des.	3
C E 3354, Intro. to Hydrology	3	C E 3341, Prin. of Struc. Des.	3
C E 3371, Envir. Engr. I	3	C E 3321, Intro. to Geotech. Engr.	3
C E 3171, Envir. Engr. Lab.	1	C E 3121, Geotech. Engr. Lab.	1
C E 3130, Civil Engr. Seminar II	1	C E 3302, Dynamics	3
C E 3105, Mech. of Fluids Lab.	1	E E 2304, Elec. Sys. Anal.	3
PHYS 2301, Prin. of Phys. II	3		<u>16</u>
PHYS 1106, Prin. of Phys. II (Lab.)	1		
	<u>17</u>		

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
C E 4343, Des. Concr. Struct.	3	C E 4330, Des. Engr. Sys.	3
C E 4292, Engr. Ethics & Prof.	2	C E 4361, Transport. Engr.	3
IE 3301, Engr. Eco. Anal.	3	C E 4293, Engr. Law	2
M E 3321, Thermodynamics	3	†Elective (prof. dev.)	3
††Elective (humanity)	3	††Elective (humanity)	3
†Elective (design)	3	†Elective (design)	3
	<u>17</u>		<u>17</u>

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutr—138.

MATH 1551 and 1552 may be taken in lieu of MATH 1350, 1351, and 1352 with prior departmental approval.

*See Alternate Freshman Year.

**Two semesters of C E 1130 are required for graduation.

†Electives should be selected to fulfill the General Education Requirements and as follows:

English Technical Writing—technical writing course taken prior to junior year should be ENGL 2309; after sophomore year, ENGL 3365.

Design—engineering design electives include C E 4321, 4342, 4353, 4371.

Professional Development—choose from ACCT 2304, MGT 3370, 3373, 3374, 3376, F R 2320, COMS 2300, 3308, CTEC 4341, 4342, or others approved by the department.

††Humanity elective—choose 6 hours from list in General Education course inventory in schedule of classes.

Oral Communication—MGT 3373, COMS 2300 and 3308 meet General Education Requirements.

Courses in Civil Engineering. (C E)

- 1130. Civil Engineering Seminar I (1:0:2).** Introduction of first-year civil engineering students to the subdisciplines of practice in civil engineering.
- 1305. Engineering Analysis I (3:3:0).** Corequisite: MATH 1350. The profession of engineering and its relation to energy, materials, resources, computers, communication, and control. BASIC programming. Synthesis and analysis of typical engineering problems.
- 2101. Construction Materials Laboratory (1:0:3).** Corequisite: C E 1305. Laboratory determination of engineering properties of construction materials including steel, concrete, aluminum, wood, and masonry.
- 2210. Procedures of Problem Analysis I (2:2:0).** Prerequisite: CE 1305; corequisite: MATH 1352. 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.
- 3103. Mechanics of Solids Laboratory (1:0:3).** Prerequisite: C E 3303. Laboratory testing and demonstration of mechanical properties of solid materials.
- 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 II (1:0:2).** Prerequisite: Junior standing. Study of concepts of professionalism, engineering practice, and effectiveness of oral and written communications.
- 3171. Environmental Engineering Laboratory I (1:0:3).** Corequisite: C E 3371. Performance of standard analytical methods used to measure water and wastewater quality. Evaluation of limits to data produced by standard methods.
- 3210. Procedures of Problem Analysis II (2:2:0).** Corequisite: C E 2210. Application of selected basic and advanced problem solving techniques.
- 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.
- 3306. Stress Analysis (3:2:3).** Prerequisite: C E 3303. Analytical and experimental studies of stresses and strains in solid materials under various loads.
- 3321. Introduction to Geotechnical Engineering (3:3:0).** Prerequisite: CE 3303; corequisite: C E 3121. Physical properties of soils; theories of soil strength, consolidation, and settlement; soil stabilization; slope stability analysis; selected design topics.
- 3341. Principles of Structural Design (3:3:0).** Prerequisite: C E 3440. Fundamental principles of structural design with consideration for the selection of materials and systems.
- 3354. Engineering Hydrology (3:3:0).** Prerequisite: C E 3305; corequisite: C E 3210. Analysis and design methods related to the occurrence and distribution of surface and groundwater; precipitation, infiltration, runoff, and frequency analysis.
- 3371. Environmental Engineering I (3:3:0).** Prerequisite: CHEM 1308, C E 3305. An introduction to water and wastewater treatment principles, processes, and operations.
- 3372. Water Systems Design (3:3:0).** Prerequisite: C E 3305; corequisite: C E 3105, 3354. Hydraulic analysis and design of municipal water distribution, stormwater collection, and wastewater collection systems.
- 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.
4092. **Law and Ethics in Engineering (V1-3)**. Prerequisite: Senior standing in engineering or approval of department chairperson. Professional and industrial problems, contracts, specifications, ethics in engineering.
4131. **Special Studies (1)**. Individual study of engineering problems of special interest and value to the student.
4292. **Engineering Ethics and Professionalism (2:2:0)**. Prerequisite: Senior standing or approval of department chairperson. Principles and practice of engineering ethics and professionalism.
4293. **Engineering Law (2:2:0)**. Prerequisite: Senior standing in engineering or consent of department chairperson. Engineering law as it relates to professional and industrial problems; legal aspects of contracts, specifications, and liabilities.
4321. **Geotechnical Engineering Design (3:3:0)**. Prerequisite: C E 3321. Design principles and applications involving site investigation, soil improvement, bearing capacity, settlement analysis, lateral earth pressure, spread footings, pier and pile foundations, retaining walls.
4330. **Design of Engineering Systems (3:2:3)**. Prerequisite: Senior standing, and either C E 4342 or C E 4343 or corequisite C E 4353 or C E 4371 and consent of instructor. Interdisciplinary approach to the design of complex engineering systems; should be taken during last semester of undergraduate program.
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 3306 or 3201, 3341. A course in structural steel design. Includes principles of elastic and plastic design methods.
4343. **Design of Concrete Structures (3:3:0)**. Prerequisite: C E 3306 or 3201, 3341. A course in reinforced concrete design, including design of floor and footing systems and earth retaining structures.
4344. **Design of Masonry and Timber Construction (3:3:0)**. Prerequisite: C E 3201 and 3341. A course in masonry and timber design including concrete and clay masonry, solid and laminated timber elements, and plywood construction.
4353. **Design of Hydraulic Systems (3:3:0)**. Prerequisite: C E 3305. Design of open channel and pressure conveyance systems for water; includes introduction to use of HEC-2.
4354. **Advanced Hydrology (3:3:0)**. Prerequisite: C E 3354. Design practice in hydrology including flood plain delineation, runoff determination, watershed simulation. Use of HEC-1 and other models.
4355. **Groundwater Hydrology (3:3:0)**. Prerequisite: C E 3354 or consent of instructor. Groundwater flow; well hydraulics, development, and management of groundwater resources; water quality; mathematical modeling with available software. Introduction to design of wells and well fields.
4361. **Transportation Engineering (3:3:0)**. Prerequisite: C E 3321 and senior standing or approval of instructor. Comparison of various modes of transportation, basic design and analysis concepts involved in highway, airport, railroad, and waterborne modes.
4371. **Environmental Engineering II (3:3:0)**. Prerequisite: C E 3371. Characterization of water and wastewater, and design of water and wastewater treatment 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: Junior standing. A survey of modern technology and its effect on man's society.

Computer Science

Professor William M. Marcy, Director.

Professors Archer, Gustafson, Oldham, and Vines; Associate Professors Parten, and Lakhani; Assistant Professors Bagert, English, and Li; Lecturers Corwin, Dautermann, M. Weiner, and Young; Visiting Industry Professor Davis.

The Computer Science program is administered by the College of Engineering through the Director of Computer Science. The computer science program offers studies leading to the degrees *Bachelor of Science*, *Master of Science*, and *Doctor of Philosophy*. A minor in Computer Science is offered for students in other areas.

Computer science is the theory, design, and analysis of algorithms for processing information, and the implementations of these algorithms in hardware and software. There is an implied overall balance of emphasis between hardware and software aspects of computer science. The analysis of trade-offs between hardware and software is a salient characteristic with an emphasis on efficiency and effectiveness. The result is the knowledge and skills necessary to analyze, design, and implement computer based solutions to human problem solving needs. The curriculum places a strong emphasis on writing, communication, and professional skills. The objective is to prepare a graduate for a productive professional career with a broad based understanding of computer science.

Since computer science is a laboratory science, the principles and foundations of computer science are learned through a synthesis of studies involving course work and laboratories in algorithmic processes, programming languages, computer architecture, numerical and symbolic computation, operating systems, software methodology, software engineering, information retrieval, artificial intelligence, robotics, and visualization. Additional supporting studies involve course work and laboratories in electrical science, physical science, mathematics, computer logic, and electronic technology.

All students entering the computer science program are expected to follow the sequence of courses shown in the curriculum table below and must satisfy the requirements of the Dynamic Enrollment Management Plan (DEMP) for computer science. The plan requires that all courses in the degree plan be passed with a grade of C or higher and that the overall grade-point average be 2.00 or higher.

Students demonstrating satisfactory performance may deviate from the specified sequence of courses only with the express approval of the undergraduate advisor and only when such deviation is required to obtain a normal load of course work for the student. A list of approved electives is maintained by Computer Science and all elective courses must have the approval of the undergraduate advisor.

Computer Science Curriculum.

		FIRST YEAR	
Fall		Spring	
CS 1101, Comp. Sys. Lab.	1	CS 1362, Fund. Comp. Sci. I	3
CS 1305, Intro. Comp. Sci.	3	CS 1102, Computer Sci. Lab. I	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
†MATH 1350, Anal. Geo.	3	†MATH 1351, Calculus I	3
HIST 2300, Hist. U. S. to 1877	3	HIST 2301, Hist. U. S. since 1877	3
Humanities elective	3	POLS 1301, Amer. Govt. Org.	3
P.E., Band, ROTC, or Nutr.		P.E., Band, ROTC, or Nutr.	16

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
CS 2363, Fund. Comp. Sci. II	3	CS 2104, Comp. Sci. Lab. III	1
CS 2103, Comp. Sci. Lab. II	1	CS 2364, Fund. Comp. Sci. III	3
CS 2372, Intro. Comp. Logic	3	CS 2382, Disc. Struct.	3
MATH 1352, Calculus II	3	POLS 2302, Amer. Pub. Pol.	3
PHYS 1103, Exp. Gen. Phys. I	1	MATH 2350, Calculus III	3
PHYS 1306, Gen. Phys.	3	PHYS 1104, Exp. Gen. Phys. II	1
Technical writing elect.	3	PHYS 1307, Gen. Phys.	3
	17		17

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
CS 3450, Comp. Org. & Assy. L.	4	CS 3353, File Sys. Des.	3
CS 3461, Concepts. Prog. Lang.	4	CS 3362, Adv. Dig. Des.	3
MATH 2360, Linear Algebra	3	CS 3452, Intro. Sys. Prog.	4
EE 2303, Elect. Sys. Anal.	3	COMS 3308, Bus. & Prof. Comm.	3
Ind. or group behav. elect.	3	Math. Prob. & Stat. elect.	3
	17		16

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
CS 4411, Sr. Proj. Des.	4	CS 4412, Sr. Proj. Impl. Lab.	4
CS 4472, Dig. Sys. Lab.	4	Computer sci. elect.	6
Computer sci. elect.	3	Humanities elect.	3
Tech. or prof. dev. elect.	6	Tech. or prof. dev. elect.	3
	17		16

Minimum hours for graduation, exclusive of P.E., Band, ROTC, or Nutr.—132.

*E E 2301 may be substituted for E E 2303.

*Exclusive of P.E., Marching Band, ROTC, or Nutr.

Courses in Computer Science. (C S)

1101. **Computer Systems Laboratory (1:0:3).** Corequisite: C S 1305. Introduction to computer hardware and software systems.
1102. **Computer Science Laboratory I (1:0:3).** Corequisite: C S 1362. Designed to introduce students to a variety of computer science concepts.
1300. **Computers and Modern Society (3:2:2).** Survey of computers, their uses, and their impact on society. Brief introduction to computer programming and the use of word processor, spread sheet, and data base application software. Credit may not be applied toward a computer science major or minor.
1301. **Introductory Programming with PASCAL (3:3:0).** Prerequisite: Equivalent of MATH 1320 and 1321. A first course in programming. Credit may not be applied toward a computer science major or minor.
1302. **Introductory Programming with FORTRAN (3:3:0).** Prerequisite: Equivalent of MATH 1320 and 1321. A first course in computer programming. Credit may not be applied toward a computer science major or minor.
1305. **Introduction to Computer Science (3:3:0).** Corequisite: C S 1101. The discipline of computer science and its relationship to human problem solving.
1362. **Fundamentals of Computer Science I (3:3:0).** Prerequisite: C S 1101 and 1305 or equivalent; MATH 1350 or concurrent enrollment; corequisite: C S 1102. First concepts course for computer science majors and minors.
2103. **Computer Science Laboratory II (1:0:3).** Corequisite: C S 2363. Experimental investigation of data structures.
2104. **Computer Science Laboratory III (1:0:3).** Corequisite: C S 2364. Experimental investigation of the time and space complexity of computer algorithms.
2303. **Intermediate Programming With C (3:3:0).** Prerequisite: MATH 1320, 1321, and proficiency in at least one high-level programming language. A second course in programming focusing on the programming language C. Credit may not be applied towards a computer science major or minor.

- 2304. Intermediate Programming With Ada (3:3:0).** Prerequisite: MATH 1320, 1321, and proficiency in at least one high-level programming language. A second course in programming focusing on the programming language Ada. Credit may not be applied towards a computer science major or minor.
- 2363. Fundamentals of Computer Science II (3:3:0).** Prerequisite: C S 1362 and 1102; MATH 1351 or concurrent enrollment; corequisite: C S 2103. Introduction to data structures.
- 2364. Fundamentals of Computer Science III (3:3:0).** Prerequisite: C S 2363 and 2103; MATH 2350 or concurrent enrollment; corequisite: C S 2104. A theoretical course focusing on the design and analysis of computer algorithms.
- 2372. Introduction to Computer Logic (3:2:2).** Prerequisite: C S 1362 and 1101. Introduction to stored program computers; logic design, combinatorial and sequential circuits; register arithmetic and its implementation.
- 2382. Discrete Computational Structures (3:3:0).** Prerequisite: C S 2364 and 2104 or concurrent enrollment. Sets, functions, algorithms, counting principles, logic foundations, graphs, Boolean algebra, and the foundations of the theory of computation.
- 3353. File Processing (3:3:0).** Prerequisite: C S 2364 and 2104. File structures, access methods, processing algorithms; I/O devices; sequential, relative, keyed file organizations; external sorting, hashing, and buffering algorithms.
- 3362. Advanced Digital Design (3:3:0).** Prerequisite: C S 2372, EE 2303, or equivalent. An engineering approach to digital design utilizing MSI and LSI integrated circuits. Flow charts, MDS diagrams, and a hardware oriented approach are emphasized.
- 3383. Theory of Automata (3:3:0).** Prerequisite: C S 2382. The relationship between language, grammars, and automata. Deterministic and non-deterministic machines. Pushdown automata and turing machines. The limits of computability.
- 3392. Networks and Distributed Systems (3:3:0).** Prerequisite: C S 3452. ISO models and ANSI/IEEE standards for local and wide area networks. Students working in teams implement a local area network system. An integrated hardware-software approach is emphasized.
- 3450. Computer Organization and Assembly Language Programming (4:3:3).** Prerequisite: C S 2363 and 2103 and junior standing. Computer organization and assembly language programming, system and data management macros.
- 3452. Introduction to Systems Programming (4:3:3).** Prerequisite: C S 3450. Design of various types of computer system software, including assemblers, loaders and simulators. Introduction to macro processors, compilers, and operating system features. Emphasis on relationships between machine architecture and software.
- 3461. Concepts of Programming Languages (4:3:3).** Prerequisite: C S 2363 and 2103 and junior standing. Study of programming language design. The investigation and comparison of different programming language paradigms. Languages include Ada, Lisp Smalltalk, and Prolog.
- 3462. Introduction to Artificial Intelligence (4:3:3).** Broad treatment of the field. Algorithms and knowledge structures for varied application areas such as natural language processing, expert systems, game playing, machine vision, and automatic programming. Developments of programs and systems will use standard languages in artificial intelligence.
- 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 3452. Survey of computer resource allocation and management techniques; multiprogramming, multiprocessing, and paging systems. A representative operating system will be studied in detail.
- 4353. Compiler Construction (3:3:0).** Prerequisite: C S 3461. Structure of compilers; approaches to parsing, symbol table management, and run-time storage optimization; introduction to code generation, error recovery, and code optimization.
- 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.

4375. **Machine Structure and Organization (3:3:0).** Prerequisite: C S 3362. Hardware design alternatives for a computer system to satisfy market requirements. Analysis of current systems.
4376. **Microprocessor Applications Laboratory (3:0:9).** Prerequisite: C S 4373. Application of microprocessors as data acquisition and control units. Several multitasking applications of microprocessors in robotics, real-time data acquisition, and real-time control.
4395. **Introduction to Computer Graphics (3:3:0).** Prerequisite: C S 2364 and 2104. Focus on basic principles and methods for designing, implementing, and applying graphics packages. Methods for manipulating and displaying two and three dimensional objects. Selected readings in current graphics literature and a major project are required.
4411. **Senior Project Design (4:3:3).** Prerequisite: Senior standing and 15 hours of upper-division computer science course work. Principles, techniques, and tools for hardware-software system design and development from requirements analysis through validation of performance. Project management and system maintenance considerations. Students will design a major project for implementation in C S 4412. Students will make a formal presentation of their designs.
4412. **Senior Project Implementation Laboratory (4:0:12).** Prerequisite: C S 4411. Students will implement the major project designed in C S 4411. Emphasis on project management, performance validation, and documentation; written and oral communication. Students will prepare and make a formal presentation of their projects.
4472. **Digital Systems Laboratory (4:2:6).** Prerequisite: C S 3362. Advanced digital systems design and implementation. Use of software design tools and test instrument verification of the hardware implementation.

Department of Electrical Engineering

Horn Professor Marion O. Hagler, Chairperson; Professor Kwong S. Chao, Associate Chairperson.

Horn Professors Kristiansen and Walkup; Professors Emre, Gustafson, Ishihara, Krile, Portnoy, Trost, and Vines; Associate Professors Krompholz, Mitra, O'Hair, Parten, and Zieher; Assistant Professors Baker, Giesselmann, and Mehrl; Lecturers Arrant and Simpson; Adjunct Professors Byszewski, Engelhardt, Guenther, Honig, Lacy, and Van Wyk.

This department supervises the following degree programs: **ELECTRICAL ENGINEERING**, *Bachelor of Science in Electrical Engineering*, *Master of Science in Electrical Engineering*, *Doctor of Philosophy*.

The profession of electrical engineering combines the principles of the electrical and physical sciences, using mathematics as a common language, to develop a body of knowledge and techniques for the solutions of important problems in modern technological society. These techniques include the use of computers for analyzing and designing not only conventional electrical systems, but also many environmental, economic, and biological systems which can be represented in terms of electrical concepts. The required undergraduate program is contained in the curriculum table shown below. The objective of the curriculum is to prepare a graduate who is sensitive to the consequences of his or her work, ethically as well as professionally, for a productive professional career. A broad educational background has been incorporated into this curriculum, and personalized advising plays an important role in its implementation.

Students will be responsible for arranging a course of study with an advisor's counsel and approval. Students whose high school courses include physics, chemistry, mathematics through analytical geometry, and at least two credits for a single foreign language are expected to follow the sequence of courses shown in the curriculum. However, students who lack credits in any of these areas of study in high school should consult with departmental advisors to determine a suitably adjusted first year schedule. The exceptionally well-prepared student should consult the section of this catalog on credit by examination. All students must satisfy the academic performance requirements of the Dynamic Enrollment Management Plan (DEMP), copies of which are available from the Department of Electrical Engineering. Any student within nine semester hours of graduation may take courses for graduate credit. Students interested in a dual degree program should consult a faculty advisor.

Electrical Engineering Curriculum.

FIRST YEAR			
Fall		Spring	
†MATH 1351, Cal. I	3	MATH 1352, Cal. II	3
CHEM 1307, Prin. of Chem. I	3	CS 1362, Fund. of Comp. Sci. I	3
CHEM 1103, Prin. of Chem. I (Lab.)	1	CS 1102, Comp. Sci. Lab. I	1
EE 1305, Intro. Engr. & Comp. Prog.	3	EE 2301, Intro. Cir. Anal. I	3
POLS 1301, Amer. Govt., Org.	3	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	**Elective	3
P.E., Band, ROTC, or Nutr.		P.E., Band, ROTC, or Nutr.	
16††		16††	
SECOND YEAR			
Fall		Spring	
MATH 2350, (Dual) Calculus III	3	EE 2371, Anal. Tech. of Elec. Eng.	3
MATH 3350, (Dual) Math. for Engrs. I	3	EE 3311, Electronics I	3
PHYS 1308, Prin. of Phys. I	3	EE 2331, Proj. Lab. I	3
PHYS 1105, Prin. of Phys. I (Lab.)	1	PHYS 2301, Prin. of Phys. II	3
EE 2302, Intro. Cir. Anal. II	3	PHYS 1106, Prin. of Phys. II (Lab.)	1
**Elective	3	EE 2372, Mod. Digital Syst. Desgn.	3
16		17	
THIRD YEAR			
Fall		Spring	
EE 3332, Proj. Lab. II	3	EE 3361, Fund. Elect. Dev.	3
EE 3323, Prin. Comm. Sys.	3	EE 3333, Proj. Lab. III	3
EE 3341, Electromag. Theory I	3	EE 3342, Electromag. Theory II	3
EE 3312, Electronics II	3	EE 3351, Energy Convr. I	3
EE 3362, Anal. & Dig. Comp.	3	EE 3353, Feedback Contr. Sys.	3
ME 3321, Engr. Thermo.	3	**Elective	3
18		18	
FOURTH YEAR			
Fall		Spring	
EE 4333, Senior Proj. Lab. IV	3	EE 4334, Proj. Lab. V	3
†Elective (mathematics)	3	**Elective	15
Elective	12		18
18			

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutr.—133.

†MATH 1350 may be used for the mathematics elective, if credit is received before taking MATH 1351.

*Students who do not have high school credit for chemistry or physics must take CHEM 1301 and/or PHYS 1303 before those listed.

**Electives from the following categories must be selected from approved lists available from the Department of Electrical Engineering to ensure that ABET, General Education, departmental, and legislative requirements are satisfied: political science, history, humanities and fine arts, individual and group behavior, basic science, electrical engineering, and engineering other than electrical.

††Exclusive of P.E., Band, ROTC, and Nutr.

Courses in Electrical Engineering. (E E)

1305. **Introduction to Engineering and Computer Programming (3:3:0).** Prerequisite: High school algebra and trigonometry; corequisite: MATH 1350 or 1351. The profession of engineering and its relation to science, energy, mathematics, materials, communications, and economics. Computer programming and computer-aided drafting.
2301. **Introductory Circuit Analysis I (3:3:0).** Corequisite: MATH 1352. Principles of electric and magnetic circuits. Network theorems and analysis techniques. Fundamentals of resistance, inductance, and capacitance.
2302. **Introductory Circuit Analysis II (3:3:0).** Prerequisite: EE 2301, corequisite: MATH 3350. Transient and sinusoidal steady-state analysis. Applications of the Laplace transform.
2303. **Electrical System Analysis (3:3:0).** Corequisite: MATH 2350. Steady-state RLC network analysis. Introduction to transformers and motors.
2331. **Project Laboratory I (3:1:6).** Prerequisite: EE 2302. Corequisite: EE 3311. A laboratory course to accompany second year basic courses in electrical engineering.
2371. **Analytical Techniques for Solutions of Electrical Engineering Problems (3:3:0).** Prerequisite: MATH 3350. Analytical techniques applied to electrical engineering problems.
2372. **Modern Digital System Design (3:3:0).** Prerequisite: EE 2301. An introduction to combinational, sequential, and microprocessor based digital systems. Hardware and software aspects are considered.
3304. **Electronics, Computers, and Instrumentation (3:3:0).** Prerequisite: EE 2303. Introduction to semiconductors. Diodes, BJTs, and MOSFETs. Equivalent circuit analysis, basic computer circuits, information processing and instrumentation.
3311. **Electronics I (3:3:0).** Prerequisite: EE 2302. Introduction to modeling of electronic devices. Principles of elementary electronic circuit design and analysis.
3312. **Electronics II (3:3:0).** Prerequisite: EE 3311, Phase III standing in electrical engineering. Frequency response of amplifiers, power amplifiers, feedback concepts, active filters, oscillators.
3323. **Principles of Communication Systems (3:3:0).** Prerequisite: EE 2302 and 2371 or MATH 3351, junior standing in electrical engineering. Fourier transforms and linear systems concepts. Probability and random variables. Amplitude, phase angle, and pulse modulation communication systems.
3332. **Project Laboratory II (3:1:6).** Prerequisite: EE 3311 and 2331, Phase III standing in electrical engineering; corequisite: EE 3312, 3323, and 3362. A laboratory course to accompany third-year basic courses in electrical engineering.
3333. **Project Laboratory III (3:1:6).** Prerequisite: EE 3312 and 3332, Phase III standing in electrical engineering; corequisite: EE 3342, 3351, and 3353. A laboratory course to accompany third-year basic courses in electrical engineering.
3341. **Electromagnetic Theory I (3:3:0).** Prerequisite: EE 2371 or MATH 3351, Phase III standing in electrical engineering. General treatment of static electric and magnetic fields from the vector viewpoint. Maxwell's equations.
3342. **Electromagnetic Theory II (3:3:0).** Prerequisite: EE 3341, Phase III standing in electrical engineering. General solutions for Maxwell's equations. Traveling waves in scalar media. Boundary conditions and constraints imposed by bounding surfaces.
3351. **Energy Conversion I (3:3:0).** Prerequisite: EE 2302, 3341, and Phase III standing in electrical engineering. Analysis, design, applications, and performance of electromagnetic and electromechanical machinery.
3353. **Feedback Control Systems (3:3:0).** Prerequisite: EE 3312, 3323, Phase III standing in electrical engineering. An introduction to the analysis and design of automatic control systems. Control system concepts. Controller design and digital control.
3361. **Fundamentals of Electronic Devices (3:3:0).** Prerequisite: EE 3341, Phase III standing in electrical engineering. Introduction to semiconductor physics, electronic devices, and their models.

- 3362. Engineering Approach to Digital Design (3:3:0).** Prerequisite: E E 2372 and Phase III standing in electrical engineering. Design and applications of advanced digital systems including combinational, sequential, and microprocessor based systems.
- 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).** Prerequisite: E E 3312, senior standing in electrical engineering. Principles of transducers. External and implantable electrodes. Bioelectric phenomena. Respiration, blood flow. Electrocardiography, plethysmography, encephalography, muscular activity.
- 4316. Power Electronics (3:3:0).** Prerequisite: E E 3312 and senior standing. Switch mode power conversion, converters and inverters, power supplies and regulators, and power semiconductor circuits.
- 4317. High Power RF Design and Application (3:3:0).** Extension of electronic circuits and components to the design of high power rf applications. Electrical, mechanical, and thermal stresses encountered in applications such as dielectric heating, induction heating, lasers, plasmas, and propagation of electromagnetic energy.
- 4318. Physical Electronics (3:3:0).** Prerequisite: E E 3342, 3361. Basic physical and thermodynamic properties of materials. Applications to lasers and pulsed power. Advanced concepts, including magnetic and semiconducting devices.
- 4320. Digital IC Analysis and Design (3:3:0).** Prerequisite: Senior standing in electrical engineering. Design of VLSI digital integrated circuits including basic device theory and processing technologies.
- 4321. Analog IC Analysis and Design (3:3:0).** Prerequisite: Senior standing in electrical engineering. Design of analog integrated circuits including basic device theory and processing technologies.
- 4322. Applications of Analog Integrated Circuits (3:3:0).** Prerequisite: Senior standing in electrical engineering. Characteristics and applications of analog integrated circuits.
- 4323. Modern Communication Circuits (3:3:0).** Prerequisite: Senior standing in electrical engineering. Analysis and design techniques for modern communication circuits.
- 4324. Computer-Aided Circuit Analysis (3:3:0).** Prerequisite: E E 1305 (or equivalent knowledge of one major computer language), E E 2302, 2371, and 3311 or MATH 3351. Development, implementation, and application of advanced circuit models for the design of integrated circuits. Designed to enhance design skills through direct application of computer-aided analysis tools.
- 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 (3:3:0).** Individual experimental studies in current problems of special interest in advanced electrical engineering technology.
- 4333. Senior Project Laboratory IV (3:0:9).** Prerequisite: E E 3333, senior standing in electrical engineering. A laboratory course to accompany fourth-year courses in electrical engineering.
- 4334. Project Laboratory V (3:0:9).** Prerequisite: E E 4333. A laboratory course to accompany fourth year courses in electrical engineering.
- 4341. Microwave Systems (3:3:0).** Prerequisite: E E 3342, senior standing in electrical engineering. Circuit analysis of microwave systems. Waveguides and microwave components, microwave tubes, solid state devices.
- 4342. Microwave Solid-State Circuits (3:3:0).** Prerequisite: E E 1305, 2302, 3312, 3342, and 3361. Study of microwave electronics and design at the device and solid-state circuit level. Circuit design issues such as transistor-based amplifier design, noise, broadband, and high-power considerations, and microwave oscillators. Device

- topics to be included are special diodes, avalanche devices, and other active devices.
433. **Introduction to Power Systems (3:3:0).** Prerequisite: Senior standing in electrical engineering. Electrical utility system generating plants. Transmission and distribution systems.
434. **Introduction to Pulsed Power Design (3:3:0).** Prerequisite: E E 3342, 3323, 3312, senior standing in electrical engineering. Design considerations for pulsed power systems including components, switching, capacitive and inductive energy storage, PFN design, and grounding and shielding procedures.
432. **Energy Conversion II (3:3:0).** Prerequisite: E E 3361, senior standing in electrical engineering. Advanced topics in energy conversion and alternate energy sources. Thermoelectric, photoelectric, and thermionic converters. Magnetohydrodynamic and electro-gas-dynamic generators. Fuel cells, nuclear reactors, and wind and solar devices.
430. **Fiber Optic Systems (3:3:0).** Prerequisite: Senior standing in electrical engineering. Optical fiber couplers, sources, and detectors; applications to communications and sensing.
431. **Advanced Communication Systems (3:3:0).** Prerequisite: E E 3323, senior standing in electrical engineering. Information transmission in electronic systems. Modulation, demodulation, frequency conversion, and multiplexing. Noise and noise spectra. Spectrum, envelope, and instantaneous frequency relations. Quantization techniques.
432. **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.
433. **Feedback Control Systems II (3:3:0).** Prerequisite: E E 3353, senior standing in electrical engineering. 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.
434. **Digital Signal Processing (3:3:0).** Prerequisite: E E 3323, senior standing in electrical engineering. An introduction to digital signal processing. Sampling, z-transform, discrete and fast Fourier transforms, flowgraphs, design techniques for digital filters, effects of finite word length, and applications.
431. **VLSI Fabrication Technology (3:3:0).** Prerequisite: E E 3312, 3361, senior standing in electrical engineering. Theory of fabrication of diodes, transistors, capacitors, resistors into functional arrays. Distributed R-C networks. Linear and digital functional blocks.

Engineering Physics

Professor Darrell L. Vines (E.E.), Coordinator; Professor Hatfield (Phys.), Director; Professor Portnoy (E.E.), Director. Horn Professors Hagler (E.E.), Kristiansen (E.E.) and Walkup (E.E.); Professors Borst (Phys.), Carper (M.E.), Davenport (M.E.), Marcy (E.E.), Menzel (Phys.), Myles (Phys.), and Trost (E.E.); Associate Professors Lichti (Phys.) and Peters (Phys.). Assistant Professor Lamp (Phys.)

This department 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. Speciality 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).

In the first semester of the sophomore year, the student should consult the advisor in the engineering department in which he expects to specialize. 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. The student, in consultation with the physics advisor and the engineering advisor, selects the courses to be used for the electives shown in the curriculum below. This allows considerable flexibility to accommodate the various programs available in the engineering departments.

In accordance with the College of Engineering Dynamic Enrollment Management Plan, a student majoring in Engineering Physics must complete with a minimum grade of C the phase I program specified for all engineering majors. The student must then petition the program coordinator to enter phase II. The criteria for the student to successfully complete phase II are determined by the engineering department in which the student has chosen to specialize. The requirements are set forth in the catalog under that department listing. Successful completion of phase II allows the student to petition for entrance to phase III, once again subject to the stipulations of the specialty department.

Engineering Physics Curriculum.

FIRST YEAR

<i>Fall</i>		<i>Spring</i>	
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 1301, Amer. Govt., Org.	3	CHEM 1308, Prin. Chem. II	3
P.E., Band, ROTC, or Nutr.		CHEM 1104, Prin. Gen. Chem. II (Lab.)	1
	16*	P.E., Band, ROTC, or Nutr.	17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
POLS 2302, Amer. Pub. Pol.	3	M E 2311 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 3304, Elect., Comp. & Instr.	3
C E 2301, Statics	3		16
	16		

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
MATH 3350, Math. for Engrs. I	3	MATH 3351, Math. for Engrs. II	3
PHYS 3204, Intermed. Lab.	2	PHYS 3306, Elect. & Mag.	3
PHYS 3305, Elect & Mag.	3	†Technical elective	4
***Engineering specialty elect.	5	***Engineering specialty elect.	6
Humanity elective	3		16
	16		

FOURTH YEAR

Fall		Spring	
PHYS 4304, Mechanics	3	PHYS 4305, Mechanics	3
†Technical elective	3	PHYS 4306, Senior Project	3
HIST 2300, Hist. of U.S. to 1877	3	HIST 2301, Hist. of U.S. since 1877	3
***Engineering specialty elect.	6	Humanity elective	3
Elective	3	***Engineering specialty elect.	6
	18		18

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutr.-133.

*Exclusive of P.E., Band, ROTC, or Nutr.

To meet the General Education Requirements, an oral communication course must be included.

†Must be approved upper-level engineering or physics courses.

‡Some engineering departments may substitute another course.

§E E 2301, 2302 should be substituted for E E 2303, 2304 by those specializing in electrical engineering.

***Must be those listed below for E. E. or M. E. specialty or others approved by coordinator, director, and dean. 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 3231, 3232, 3233, 3311, 3312, 3323, 4333, 4344, and E E 4351.

Mechanical Engineering (Thermal Science)

M E 3321, 2311, 2312, 3364, 3371, 3365, 3370, 4370, 3362, 4371, and 4372.

Department of Industrial Engineering

Professor Tom B. Leamon, Chairperson.

Hon Professors Ayoub and Dudek; Professors Burford, Ramsey, J. Smith, and M. Smith;
Associate Professor Kolarik; Assistant Professors Endsley, Ford, and Zhang; Visiting
Industry Professor Kitchens.

This department supervises the following degree programs: **INDUSTRIAL ENGINEERING**, *Bachelor of Science in Industrial Engineering*, *Master of Science in Industrial Engineering*, *Doctor of Philosophy*.

Modern industrial engineering is a combination of basic engineering knowledge and quantitative analysis techniques to support managerial decision making. Industrial engineers use the information and techniques from physical, mathematical, biological, behavioral, and engineering sciences to plan, control, design, and manage complex organizations and systems. Just as the other branches of engineering use the laws of physical sciences in designing and operating a product, industrial engineering applies these same laws to designing and operating systems in which these products are produced or in which services are provided. The major distinction between industrial engineering and other branches of engineering is that the industrial engineer must consider not only the behavior of inanimate objects, as they are governed by physical laws, but also the behavior of people as they operate together in organizations, whether these organizations be simple or complex. To increase the effectiveness of the industrial engineer, the program emphasizes technical communication (both oral and written) within all the fields of study.

The curriculum is designed to prepare the student for a professional career in the analysis and design of man-machine work systems, in keeping with the goals of the College of Engineering. The undergraduate degree requirements appear in the accompanying curriculum table.

Students entering the industrial engineering program will be assigned a faculty advisor and will be responsible for arranging a course of study with the

advisor's counsel and approval. All students enrolled in this program are expected to follow the sequence of courses shown in the curriculum and must satisfy the requirements of the Dynamic Enrollment Management Plan (DEMP) for the Department of Industrial Engineering. Copies of the DEMP are available in the Department of Industrial Engineering.

Industrial Engineering Curriculum.

FIRST YEAR			
Fall		Spring	
I E 1101, Intro. to I.E.	1	I E 2351, Prin. of Ind. Auto.	3
I E 1305, Engr. Anal. I	3	MATH 1351, Calculus I	3
MATH 1350, Anal. Geom.	3	ENGL 1302, Adv. Coll. Rhetoric	3
ENGL 1301, Ess. Coll. Rhetoric	3	E GR 1306, Engr. Graphics	3
CHEM 1307, Prin. of Chem. I	3	**Elective (basic science)	4
CHEM 1103, Prin. of Chem. I (Lab.)	1	P.E., Band, ROTC, or Nutr.	18
Social Science-Hum.	3		
P.E., Band, ROTC, or Nutr.			
	17*		
SECOND YEAR			
Fall		Spring	
I E 2301, Eng. Design Prod.	3	I E 3351, Mfg. Process I	3
MATH 1352, Calculus II	3	ECO 2305, Prin. of Eco.	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	PHYS 2301, Prin. of Phys. II	3
CH E 3330, Engr. Matl. Sci. or M E 2311	3	PHYS 1106, Prin. of Phys. II (Lab.)	1
	16		16
THIRD YEAR			
Fall		Spring	
I E 3301, Engr. Eco.	3	I E 3311, Op. Research I	3
I E 3341, Engr. Stat.	3	I E 3361, Work Anal. & Des.	3
I E 3343, Q.C. & Engr. Stat.	3	I E 3371, Production Contr.	3
M E 3321, Thermo.	3	I E 3372, Mgt. Syst. Contr.	3
MATH 1350, Math for Engrs. I	3	E E 2303, Elec. Sys. Analy.	3
***Soc. Sci.-Hum.	3	***Soc. Sci.-Hum.	3
	18		18
FOURTH YEAR			
Fall		Spring	
I E 4311, Operations Res. II	3	I E 4333, Senior Design Proj.	3
I E 4361, Ergonomics I	3	†I E elective II	3
†I E elective	3	†I E elective III	3
††Soc. Sci.-Hum.	3	††Soc. Sci.-Hum.	6
Elective (General)	3		15
#Elective (Technical)	3		
	18		

Minimum hours required for graduation exclusive of P.E., Band, ROTC, or Nutr.-134.

*Exclusive of P.E., Band, ROTC, or Nutr.

†I E technical electives from the following courses: I E 4312, 4331, 4332, 4341, 4351, 4352, 4353, 4362, 4363

**Basic science elective must be BIOL 1402, CHEM 1308 and 1104, GEOL 1303 and 1101, PHYS 2402, or ZOOL 2403

††Social sciences-humanities must include 6 hours of American history, 6 hours of American government (normally POLS 1301 and 2302), and 6 hours of humanities electives from the list of approved humanities electives from the College of Engineering.

#Technical elective from the following courses: C E 3302, 3303, 3305, 3321, 3371, E E 2304, M E 2312, 3342, I E 4341

Courses in Industrial Engineering. (I E)

1101. **Introduction to Industrial Engineering (1:1:0).** The profession of industrial engineering, history of production systems, the profession and its relation to resources utilization and control.
1305. **Engineering Analysis (3:3:0).** Use of microcomputers in engineering analysis and design. Structured programming languages.
2301. **Engineering Design in Production Operations (3:3:0).** Prerequisite: I E 1305 and EGR 1306. The engineering design process applied to development management objectives, resource planning, product design, production operations and engineering design team operations.
2351. **Principles of Industrial Automation (3:2:3).** Prerequisite: I E 1305 and sophomore standing. Principles of design of industrial automation and real-time systems using structured languages. Hardware and software interfacing.
3301. **Engineering Economic Analysis (3:3:0).** Prerequisite: MATH 1352 or equivalent. Evaluation of engineering proposals using time value of money. Selections between alternatives, break even and minimum cost studies, depreciation, taxes, replacement studies, life cycle costing, and inflation.
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.
3311. **Operations Research I (3:3:0).** Corequisite: MATH 2350. Introduction to operations research, linear programming, dynamic programming, integer programming, traveling salesman problem, transportations, and assignment problems.
3341. **Engineering Statistics (3:3:0).** Corequisite: MATH 2350. Descriptive statistics, probability theory, discrete and continuous distributions, point and interval estimates, sampling distributions, one- and two-parameter hypothesis testing, simple linear regression and linear correlation.
3343. **Quality Assurance and Engineering Statistics (3:3:0).** Prerequisite: I E 1305 and 3341. Quality assurance systems, quality control and statistical quality control including control charting, acceptance sampling, quality costs, and loss functions, multiple linear regression, goodness of fit testing and introduction to experimental design.
3351. **Manufacturing Engineering I (3:2:3).** Prerequisite: CH E 3330 or ME 2311 or consent of instructor. Properties of materials as related to manufacturing. Processing methods for metals, plastics, ceramics, semiconductors, and composites. Process selection, planning, and economics.
3361. **Work Analysis and Design (3:2:3).** Corequisite: I E 3341. Principles and techniques of work measurement, methods engineering, workplace design, work sampling, and predetermined time systems. Basic ergonomic principles applied to workplace design and physiological work measurement.
3371. **Production Control (3:3:0).** Prerequisite: I E 3341. Production control systems, production planning, forecasting, scheduling, materials and inventory control systems and models, learning curves, critical path methods of PERT and CPM.
3372. **Management Systems Control (3:3:0).** Prerequisite: Junior 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.
4311. **Operations Research II (3:2:3).** Prerequisite: I E 3311 or equivalent and a working knowledge of microcomputer operation. Fundamentals of Monte Carlo methods. Systematic development, programming, and analysis of computer simulation models using a high level simulation language such as GPSS, SLAM II, or SIMAN.

- 4312. Operations Research Problems (3:2:3).** Prerequisite: I E 3311 and 4311 (or equivalents). Course focuses on the application of operations research methods. Extensive use is made of case studies and projects. Problems are drawn from both public and private service systems and industrial operations.
- 4331. Individual Studies in Industrial Engineering (3).** Prerequisite: Advanced standing and departmental approval. May be repeated.
- 4332. Special Topics in Industrial Engineering (3:3:0).** Prerequisite: Advanced undergraduate standing. Current development in industrial engineering such as manufacturing, materials, robotics, engineering statistics, and ergonomics. May be repeated.
- 4333. Senior Design Project (3:3:0).** Prerequisite: Industrial engineering senior. Individual industrial engineering design project.
- 4341. Reliability Assurance and Engineering Statistics (3:3:0).** Prerequisite: I E 3342. Experimental design, reliability measures, failure and hazard distributions, reliability models, life testing, maintenance models, specialized analysis tools, introduction to SAS, and SAS procedures.
- 4351. Facilities Planning and Design (3:2:3).** Prerequisite: All required 3000-level I E courses. Modern plant layout and materials handling practices, stressing the importance of interrelationships with management planning, product and process engineering, methods engineering and production control.
- 4352. Manufacturing Engineering II (3:3:0).** Prerequisite: I E 3351 or consent of instructor. Introduction to computer-aided manufacturing. Computer-aided process planning; control and monitoring of processes. Numerical control and industrial robots.
- 4353. Metals Fabrication (3:2:3).** Prerequisite: I E 3351 or consent of instructor. Analysis and design of processing methods for metals: machining, casting, forming, and joining. Process selection and economic analysis.
- 4361. Ergonomics I (3:2:3).** The use of basic ergonomics in the design of workplaces. Anthropometry, workplace design, equipment design, hand tools, displays, and controls, information transfer, inspection, and environmental effects on workers and their performance.
- 4362. Ergonomics II (3:2:3).** Prerequisite: I E 4361. Advanced ergonomics principles. Emphasis on physiological, biomechanical, and psychological assessment of work. Establishing human capabilities and limitations.
- 4363. Work and Product Safety Engineering (3:3:0).** Prerequisite: Junior or senior standing. Principles of design for work and product safety, accident theory, loss prevention, accident cost analysis, standards and regulations, system safety, hazards recognition, evaluation and control, product safety, and liability.

Department of Mechanical Engineering

Professor Edward E. Anderson, Chairperson.

Professors Carper, Davenport, Lawrence, Powers, and Somerville; Associate Professors Cardenas-Garcia, Chyu, Dunn, Ertas, Jordan, Maxwell, Oler, and Reis; Assistant Professors Koh, Parameswaran, and Rasty; Lecturer Jones; Visiting Lecturer Potter.

This department supervises the following degree programs: **MECHANICAL ENGINEERING**, *Bachelor of Science in Mechanical Engineering*, *Master of Science in Mechanical Engineering*, *Doctor of Philosophy*.

The program in mechanical engineering has been designed and developed to equip the student to become a highly qualified engineering professional in a career which offers diversity, challenge, and a bright future at the forefront of innovative technology. Mechanical engineering is the broadest of the engineering disciplines with a curriculum providing a strong foundation in math-

ematics and the physical sciences of chemistry and physics followed by in-depth education in four of the principal engineering sciences—thermal science, fluids engineering, materials engineering, and solid mechanics-mechanical design. Graduates with a degree in mechanical engineering will find that employment opportunities cover a wide spectrum including the aerospace, petroleum production and refining industries, petrochemicals, electrical power, electronics, manufacturing, food-beverage processing, and many others. Mechanical engineering graduates may also be involved with alternate and advanced energy sources, composite materials, advanced computer control of mechanical systems, and computer-aided design.

Problem-solving techniques learned in the mechanical engineering curriculum are also often applied to continued educational pursuits or graduate study in engineering as well as in areas such as law, medicine, business administration, or other professional careers.

The department requires its students to have computational devices for use in the classroom and at home. As a minimum, the department recommends that students have a scientific calculator for classroom and home use. Junior and senior-level students will also find it advantageous to have a personal computer for home use which supports high level programming languages and application packages such as word processors and spreadsheets.

In addition to the Dynamic Enrollment Management Plan outlined by the College of Engineering, a student must earn a grade of C or higher in MATH 2350, 3350, C E 3303, M E 3321, and 3331. A student who receives a grade of D or F in any of these courses must immediately repeat that course.

As a general prerequisite for engineering courses, students must have successfully completed all engineering and mathematics courses which precede the course in question by two or more semesters in the accompanying curriculum table. The following course descriptions may include additional prerequisites and/or corequisites.

The undergraduate degree requirements appear in the accompanying curriculum table.

Mechanical Engineering Curriculum.

FIRST YEAR			
<i>Fall</i>		<i>Spring</i>	
MATH 1350, Anal. Geom.	3	MATH 1351, Calculus I	3
CHEM 1307, Prin. of Chem. I	3	PHYS 1308, Prin. of Phys. I	3
CHEM 1103, Prin. Chem. I (Lab.)	1	PHYS 1105, Prin. of Phys. I (Lab.)	1
ENGL 1301, Ess. Coll. Rhetoric	3	ENGL 1302, Adv. Coll. Rhetoric	3
M E 1305, Engr. Anal. I	3	E GR 1306, Engr. Graphics	3
HIST 2300, Hist. of U.S. to 1877	3	Elective (history)	3
P.E., Band, ROTC, or Nutr.		P.E., Band, ROTC, or Nutr.	
	<u>16</u>		<u>16</u>
SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
MATH 1352, Calculus II	3	MATH 2350, Calculus III	3
PHYS 2301, Prin. of Phys. II	3	E E 2303, Elect. Sys. Anal.	3
PHYS 1106, Prin. of Phys. II (Lab.)	1	M E 2312, Mechanisms	3
M E 2311, Materials	3	C E 3303, Mech. of Solids	3
C E 2301, Statics	3	ENGL 3365, Tech. Writing	3
POLS 1301, Amer. Govt., Org.	3	I E 3322, Engr. Econ. Anal.	3
	<u>16</u>		<u>18</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
M E 3218, Measurements	2	M E 4252, Thermal Systems Lab.	2
M E 3321, Engr. Thermo. I	3	M E 3371, Heat Transfer	3
M E 3364, Intro. to Mach. Design	3	M E 3365, Mach. Comp. Design	3
M E 3316, Comp. Meths. in M. E.	3	M E 3331, Dynamics	3
MATH 3350, Higher Math. Engr. I	3	Elective (political science)	3
E E 3304, Electronic Instr.	3	M E 3370, Fluid Mechanics	3
	<u>17</u>		<u>17</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
M E 3362, Engr. Thermo II	3	M E 4333, Dyn. & Cont. of Sys.	3
M E 3251, Thermal Sys. Lab.	2	M E 4371, Design II	3
M E 4370, Design I	3	Elective (mech. engr. design)	3
M E 4372, Comp. -Aided Design	3	*Elective (technical)	3
Elective (mech. engr.)	3	Elective (mech. engr.)	3
†Elective (math. or science)	3	**Elective (humanities)	3
	<u>17</u>		<u>18</u>

*Select from science, mathematics, or engineering courses.

**Select from departmentally approved list.

†Select from courses in mathematics, chemistry, physics, or biology.

Courses in Mechanical Engineering. (M E)

- 1305. Engineering Analysis I (3:3:0).** Corequisite: MATH 1350. Introductory problems characteristic of mechanical engineering. Introduction to FORTRAN or C programming.
- 2311. Materials (3:3:0).** Prerequisite: CHEM 1307. Fundamental thermodynamic and chemical nature of the structure and properties of materials.
- 2312. Mechanisms (3:3:2).** Prerequisite: M E 1305, MATH 1351. Planar cams and kinematics; spur and helical gear geometry and gear trains, linkage position and velocity analysis and synthesis of linkages. Computer applications. Working knowledge of a computer programming language such as FORTRAN, C, or BASIC is required.
- 3218. Measurements and Instrumentation (2:1:3).** Corequisite: M E 3321, E E 2304. General experimental methods, uncertainty analysis, graphical presentation of experimental data, basic instrumentation principles as applied to mechanical engineering systems.
- 3251. Thermal Systems Laboratory (2:1:3).** Prerequisite: M E 3218; corequisite: ENGL 3365. Testing, evaluating, interpreting, and reporting the characteristics of thermal systems.
- 3316. Computational Methods in Mechanical Engineering (3:3:0).** Corequisite: MATH 3350. An introductory treatment of numerical procedures used in digital computer solution of typical problems found in mechanical engineering practice. Working knowledge of a computer programming language such as FORTRAN, C, or BASIC is required.
- 3321. Engineering Thermodynamics I (3:3:0).** Prerequisite: MATH 2350, PHYS 2301. Properties of pure substances, ideal gas behavior, first and second law analysis, and applications to energy conversion and power cycles.
- 3331. Dynamics (3:3:0).** Prerequisite: MATH 2350, C E 2301. Kinematics and kinetics of a particle and rigid bodies.
- 3362. Engineering Thermodynamics II (3:3:0).** Prerequisite: M E 3321. Principles of thermodynamics for general systems, cycle analysis, availability and irreversibility, thermodynamics of state, thermodynamics of nonreacting and reacting mixtures.
- 3364. Introduction to Machine Design (3:3:0).** Prerequisite: M E 2312 and C E 3303; corequisite: MATH 3350. Analytical and numerical methods in stress analysis.

- introduction to machine component design and failure theories and their applications.
3365. **Machine Component Design (3:3:0)**. Prerequisite: M E 3364. Analysis, design, and evaluation of machine elements.
3370. **Fluid Mechanics (3:3:0)**. Prerequisite: M E 3321 and C E 2301. Basic principles of fluid statics, fluid dynamics, ideal and viscous flows, and turbomachinery.
3371. **Heat Transfer (3:3:0)**. Prerequisite: M E 3321 and 3316. Introduction to heat transfer by the mechanisms of conduction, convection, and radiation.
4252. **Mechanical Systems Laboratory (2:1:3)**. Prerequisite: M E 3218; corequisite: ENGL 3365. Testing, evaluating, interpreting, and reporting the characteristics of mechanical systems.
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.
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.
4333. **Dynamics and Control of Systems (3:3:0)**. Prerequisite: M E 3316, 3331. Modeling and analysis of dynamic mechanical, electrical, fluid, and thermal systems. Introduction to classical and modern feedback control analysis theory.
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.
4338. **Solar Systems Design (3:3:0)**. Prerequisite: M E 3371. Fundamental principles of the design and analysis of solar systems and components. Includes a solar heating design project.
4341. **Materials in Design (3:3:2)**. Prerequisite: M E 2311, 3365, and senior standing. Application of material selection in the design process. Approved design elective.
4343. **Mechanical Metallurgy (3:3:0)**. Introductory elasticity, plasticity, dislocation theory, and strengthening mechanisms. Testing and controlling of mechanical properties and their variation with temperature, strain rate, and microstructure.
4350. **Microprocessor Applications for Mechanical Engineers (3:3:0)**. Prerequisite: Junior standing. Design of microprocessor firmware for digital control applications. Introduction to microprocessor hardware and operation. Approved design elective.
4354. **Automotive Systems (3:3:0)**. Prerequisite: M E 3370, 3371, and 3362. Modeling and analysis of typical automobile and truck powertrains. Theory and practice are discussed with emphasis on practical applications.
4356. **Aerodynamics (3:3:0)**. Prerequisite: M E 3370. An introduction to aerodynamics including wing and airfoil theory, aircraft performance, and aircraft stability and control.
4360. **Experimental Solid Mechanics (3:3:0)**. Prerequisite: Senior standing. A review of experimental techniques in solid mechanics including strain gages, photoelasticity, moiré, and holography, including theory and practice.
4362. **Applied Mechanics (3:3:0)**. Prerequisite: Senior standing. Introduction to mechanics theory and applications including a review of elasticity.
4370. **Engineering Design I (3:2:3)**. Prerequisite: M E 3365, 3371. Design problems characteristic of mechanical engineering.
4371. **Engineering Design II (3:0:9)**. Prerequisite: M E 4370. Design projects characteristic of mechanical engineering.
4372. **Computer Aided Design (3:3:0)**. Prerequisite: M E 3371, 3365, and 3370. Computer aided analysis and design of thermal and mechanical systems using the computer.
4373. **Thermal-Fluid Systems (3:3:0)**. Prerequisite: M E 3362, 3370, and 3371. Design and analysis of thermal-fluid systems. Approved design elective.

Department of Petroleum Engineering

Roy S. Butler Professor John J. Day, Chairperson.

Professors Arnold and Land; Associate Professors Crawford and Lin; Assistant Professor Vasilache; Visiting Lecturer Bauer.

This department supervises the following degree programs: PETROLEUM ENGINEERING, *Bachelor of Science in Petroleum Engineering*; *Master of Science in Petroleum Engineering*. The objective of the department is to provide the professional education necessary to prepare an individual for a successful career in the petroleum industry.

Petroleum engineering is the practical application of the basic and physical sciences of mathematics, 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. The program supplies engineers directly to the Permian Basin and to the national and international oil and gas industries.

Students applying for transfer into this program from another institution or from another department at Texas Tech must have a minimum 2.50 cumulative grade-point average. Transfer applicants must also have minimum grade-point averages of 2.50 for all credits attempted in mathematics, science, and engineering courses.

Petroleum engineering applies the curriculum management of the college. Phase I includes the first three semesters; Phase II the fourth semester; and Phase III includes the final two years of study. Progress from one phase to the next requires an overall GPA of 2.25 or higher, designated course completion, and departmental consent. To graduate, the student must complete the specified minimum number of hours in each area of the curriculum and have a minimum overall GPA of 2.00. Changes in the degree plan or exceptions to the above stated conditions require written approval of the chairperson of the Petroleum Engineering Department.

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
GEOL 1303, Phys. Geology	3	GEOL 1304, Hist. Geol.	3
GEOL 1101, Phys. Geology Lab.	1	GEOL 1102, Hist. Geol. Lab.	1
P.E., Band, ROTC, or Nutr.		P.E., Band, ROTC, or Nutr.	
		<hr/> 17	<hr/> 17

SECOND YEAR

<i>Fall</i>		<i>Spring</i>	
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 1301, Amer. Govt., Org.	3	PETR 3313, Phase Behavior	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
	<u>16</u>	†POLS 2302, Amer. Pub. Pol.	3
			<u>19</u>

THIRD YEAR

<i>Fall</i>		<i>Spring</i>	
PETR 3202, Rot. Drig. Fluids	2	PETR 3303, Petr. Prod. Meth.	3
EE 2303, Elect. Sys. Anal.	3	PETR 3304, Well Logging Meth.	3
PETR 3302, Res. Rock Prop.	3	PETR 3103, Production Lab.	1
PETR 3113, Core Anal. Lab.	1	PETR 4303, Reservoir Engr.	3
M E 3321, Engr. Thermo.	3	CHEM 3307, Phys. Chem.	3
C E 3302, Dynamics	3	CHEM 3107, Phys. Chem. Lab.	1
MATH 3350, Math. Engrs. I	3	†HIST 2300, Hist of U.S. to 1877	3
	<u>18</u>		<u>17</u>

FOURTH YEAR

<i>Fall</i>		<i>Spring</i>	
PETR 4306, Adv. Res. Engr.	3	PETR 4305, Adv. Nat. Gas. Engr.	3
EE 3304, Elect., Comp. & Instr.	3	PETR 4105, Nat. Gas Lab.	1
PETR 4106, Reservoir Engr. Lab.	1	PETR 4331, Special Problems	3
GEOL 4324, Geol. of Petroleum	3	PETR 4300, Petr. Prop. Eval.	3
PETR 4121, Petro. Eng. Sem.	1	I E 3322, Engr. Eco. Anal.	3
*Elective (humanity)	3	**Elect. (humanity)	3
HIST 2301, Hist. of U.S. since 1877	3		<u>16</u>
	<u>17</u>		

Minimum hours required for graduation, exclusive of P.E., Band, ROTC, or Nutr.—137.

To meet the General Education Requirements, a 3-hour oral communication course will be required.

*Exclusive of P.E., Band, ROTC, or Nutr.

†May not be taken pass-fail.

**Select from departmentally approved list

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. BASIC programming. Synthesis and analysis of typical engineering problems. Unit conversions.

3103. **Production Laboratory (1:0:3).** Corequisite: PETR 3303. Experiments in reservoir characteristics, core analysis, oil recombination, corrosion, lease operation, pumping well characteristics, directional drilling, and fracturing design.

3113. **Core Analysis Laboratory (1:0:3).** Corequisite: PETR 3302. Extraction techniques to determine rock porosities, bulk volumes, saturations, fluid resistivities, fluid and rock permeabilities, single and two-phase flow parameters.

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).** Corequisite: 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 and C E 3305. 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 and CE 3305. Oil well stimulation practices. Producing practices to include hydraulic and sucker rod pumping systems.
- 3304. Well Logging Methods (3:3:0).** Prerequisite: PETR 3301, PHYS 2301, and 1106. Well logging theory and techniques as applied to quantitative formation analysis. Field examples and problems.
- 3305. Petroleum Fluid Flow (3:3:0).** Flow of fluids through conduits, production lines; the dynamics of viscous and nonviscous fluids, single- and two-phase flow in horizontal and vertical pipe.
- 3313. Phase Behavior (3:3:0).** Fundamentals of phase behavior of oil, gas, and water systems as related to hydrocarbon production.
- 4105. Natural Gas Laboratory (1:0:3).** Corequisite: Enrollment in PETR 4305. Natural gas analysis and testing; flow-metering devices; regulation and control devices.
- 4106. Reservoir Engineering Laboratory (1:0:3).** Corequisite: Enrollment in PETR 4306. 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.
- 4300. Petroleum Property Evaluation and Management (3:2:3).** Prerequisite: PETR 3304 and 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 3302 and 3313. 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 3303 and 3313. 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.
- 4307. Basic Principles of Reservoir Simulation (3:3:0).** Fluid flow equations and material balance concepts developed into mathematical simulators using difference solutions.
- 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 Technology

Associate Professor Fred P. Wagner, Jr., Chairperson.

Associate Professors Ernst, Farley, E. B. Reynolds and H. L. Reynolds; Assistant Professor Green; Lecturers Alayyan and Gunn.

This department supervises the following degree program: **TECHNOLOGY, Bachelor of Science in Technology.** Students may select work in one of three areas of specialization—construction, electrical-electronics, or mechanical technology.

Graduates in 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 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 81 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 51 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.

The construction specialization stresses basic structural design and construction operations to prepare students to enter various phases of the construction industry. Course work includes basic structural design and analysis, contracts and specifications, safety, surveying, cost estimating, scheduling, and transportation. 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.

Mechanical technology is concerned with energy and mechanical devices. The curriculum gives a good base for further learning, via industrial experience, in both of these areas. The curriculum is especially strong in environmental control (heating, ventilating, cooling, and humidity control), and steam powered electric generating plants. Both environmental control and steam power plants offer relatively stable employment, and many of our graduates have obtained jobs in these areas. In the area of mechanical devices courses in strength of materials, kinematics, dynamics, and design are offered. These courses equip the student to create a mechanical device that will perform the desired function and design the parts of the mechanical device with sufficient strength to perform that function. Balancing the mechanical device to provide smooth operation is included.

Students are required to plan their program in consultation with faculty advisors. Emphasis on communication skills requires the inclusion of Communication Studies (COMS 3308) and technical writing (ENGL 2309).

The Department of 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 224, Mechanical Engineering Building, 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.

The Dynamic Enrollment Management Plan is being used in the department.

Technology Curriculum.

		FIRST YEAR		
<i>Fall</i>			<i>Spring</i>	
MATH 1320, Coll. Alg. or MATH 1321	3		MATH 1321 or 1350	3
E GR 1306, Engr. Graphics	3		GTEC 1311, Tech. I	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
HIST 2300, Hist. of U.S. to 1877	3		CTEC 1312, EET 1312, or MTEC 1312	3
P.E., Band, ROTC, or Nutr.	1		P.E., Band, ROTC, or Nutr.	1
	<u>17</u>			<u>17</u>

Construction Specialization

		SECOND YEAR	
<i>Fall</i>			<i>Spring</i>
MATH 1351 or 2322	3	MATH 1352 or 2323	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	ENGL 2309, Patterns of Reports	3
GTEC 2311, Appl. Mech. I	3	CTEC 2301, Surveying and Surveys	3
COMS 3308, Bus. & Prof. Speech	3	GTEC 3311, Appl. Mech II	3
	<u>16</u>		<u>16</u>

THIRD YEAR			
<i>Fall</i>		<i>Spring</i>	
POLS 1301, Amer. Govt., Org.	3	POLS 2302, Amer. Pub. Pol.	3
CTEC 3311, Struct. Graphics I	3	GTEC 2351, Intro. to Thermo.	3
CTEC 3302, Transportation Tech.	3	CTEC 3312, Struct. Graphics II	3
GTEC 2321, Elec. Circ. & Mach.	3	CTEC 3313, Found. & Earthwork	3
GTEC 3312, Fluids	3	CTEC 3104, Soil Properties Lab.	1
CTEC 3103, Mat. Measurement Lab.	1	GTEC, 4121, Seminar	1
	<u>16</u>	General elective	<u>3</u>
			<u>17</u>

FOURTH YEAR			
<i>Fall</i>		<i>Spring</i>	
CTEC 4312, Struc. Design II	3	CTEC 4311, Struct. Design I	3
CTEC 4342, Cost Estimating	3	CTEC 4346, Cost Estimating II	3
Individual or group behavior	3	Humanity or fine arts	6
CTEC 4331, Special problems	3	CTEC 4343, Construction Safety &	
General elective	3	Health	3
	<u>15</u>	CTEC 4341, Const. Management	<u>18</u>

Electrical-Electronics Specialization

SECOND YEAR			
<i>Fall</i>		<i>Spring</i>	
MATH 1351 or 2322	3	MATH 1352 or 2323	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	EET 2314, Computer Technology	3
EET 2331, Elect. Measurements	3	EET 2312, Elect. Technology II	3
GTEC 2321, Elec. Circuits & Mach.	3	EET 2332, Electronics Lab.	3
	<u>16</u>		<u>16</u>

THIRD YEAR

<i>Fall</i>	
GTEC 2311, Applied Mech. I	3
EET 3311, Electronics Technology I	3
EET 3331, Electronics Lab. II	3
POLS 1301, Amer. Govt., Org.	3
EET 4314, Applications of Digital	3
HIST 2301, Hist. of U.S. since 1877	3
	<u>18</u>

<i>Spring</i>	
GTEC 2351, Intro. to Thermo.	3
EET 3324, Application of Linear	3
EET 3332, Electronic Systems Lab.	3
POLS 2302, Amer. Pub. Pol.	3
MATH 3322 or 2350	3
ENGL 2309, Patterns of Reports	3
	<u>18</u>

FOURTH YEAR

<i>Fall</i>	
EET 4331, Electronic & Sys. Lab. II	3
EET 3321, Circuits and Systems	3
Individual or group behavior	3
COMS 3308, Bus. & Prof. Speech	3
EET 4317, Adv. Elect. Sys.	3
	<u>15</u>

<i>Spring</i>	
EET 4332, Spec. Electronics Proj.	3
EET 4353, Electro. Mech. Contr.	3
†Elective (technology)	3
Humanities or fine arts	6
	<u>15</u>

Mechanical Specialization

SECOND YEAR

<i>Fall</i>	
MATH 1351 or 2322	3
PHYS 1306, Gen. Phys.	3
PHYS 1103, Exp. Gen. Phys. I (Lab.)	1
HIST 2301, Hist. of U.S. since 1877	3
POLS 1301, Amer. Govt., Org.	3
ENGL 2309, Patterns of Reports	3
	<u>16</u>

<i>Spring</i>	
MATH 1352 or 2323	3
PHYS 1307, Gen. Phys.	3
PHYS 1104, Exp. Gen. Phys. II (Lab.)	1
GTEC 2351, Intro. to Thermo.	3
GTEC 2311, Appl. Mech. I	3
Humanity or fine arts	3
	<u>16</u>

THIRD YEAR

<i>Fall</i>	
MATH 3322, Higher Math. for Tech.	3
GTEC 3312, Fluid Mechanics	3
MTEC 3312, Vapor & Gas Cycle Anal.	3
MTEC 4341, Metals Technology	3
MTEC 4351, Mechanisms of Machines	3
MTEC 4332, Spl. Topics in Mech. Tech.	3
	<u>18</u>

<i>Spring</i>	
GTEC 2321, Electrical Circuits	3
GTEC 3311, Strengths of Materials	3
MTEC 3321, Graphics for Mech. Tech.	3
MTEC 3322, Mech Tech Lab I	3
POLS 2302, Amer. Pub. Pol.	3
COMS 3308, Bus. & Prof. Speech	3
	<u>18</u>

FOURTH YEAR

<i>Fall</i>	
MTEC 4311, HVAC Sys. Design I	3
MTEC 4312, Applied Energy Con.	3
MTEC 4321, Mech. Tech. Lab. II	3
Individual or group behavior	3
Elective (technical)	3
	<u>15</u>

<i>Spring</i>	
MTEC 4332, HVAC Sys. Design II	3
MTEC 4322, Mech. Tech. Lab. III	3
MTEC 4352, Dynamics of Machinery	3
MTEC 4353, Mechanical Design	3
Humanity or fine arts	3
	<u>15</u>

†Appropriate technology or engineering courses, approved by the department chairperson, may be used to satisfy the technology elective requirements.

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. Computer aided drafting is used for much of the course.

Courses in General Technology. (GTEC)

- 1311. Technology I (3:3:0).** Theory and practice in logical solutions of numerical problems. Introduction to computers and computer programming with emphasis in BASIC. Students also use word processor and spreadsheet.
- 2311. Applied Mechanics I—Statics (3:3:0).** Prerequisite: PHYS 1306, 1103; corequisite: MATH 1351 or 2322. Equilibrium of planer structures; beams, trusses, frames. Friction, moments of inertia, structural mechanics.
- 2321. Electrical Circuits and Machines (3:3:0).** Corequisite: PHYS 1306, 1103; MATH 1351 or 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 1352 or 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: GTEC 2311. A study of the elastic and plastic behavior of materials and structural elements.
- 3312. Applied Mechanics III—Fluids (3:3:0).** Prerequisite: GTEC 2311. Fluid statics and dynamics, flow of fluids in pipe and open channels, and fluid measurements.
- 4121. Technology Seminar (1).** Prerequisite: Advanced standing and approval of department chairperson. Individual study of technology problems of special interest and value to the student. May be repeated for credit.
- 4331. Special Topics in Technology (3).** Prerequisite: Advanced standing and approval of chairperson. Individual studies in special areas in technology. May be repeated for credit.
- 4332. Special Experimental Studies in 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 Technology. (CTEC)

- 1312. Construction Methods (3:3:0).** Study of construction activities, project specifications and working drawings (blue prints). Field trips to local construction sites and a technical report are required.
- 2301. Surveying and Surveys (3:2:3).** Prerequisite: MATH 1320 and 1321 or equivalent. Care and use of modern surveying equipment; differential leveling, area calculations; horizontal and vertical curves; effects of observation errors.
- 3103. Materials Measurements Laboratory (1:0:3).** Prerequisite: GTEC 3311. The study and testing of construction materials to include concrete mix design.
- 3104. Soil Properties Laboratory (1:0:3).** Prerequisite: GTEC 3311. The study and testing of the various physical properties of soils
- 3302. Transportation Technology (3:3:0).** Prerequisite: CTEC 2301, GTEC 2311. Design of components of the transportation system needed for modern society with practical examples.
- 3311. Structural Graphics I (3:3:0).** Corequisite: GTEC 3311. Graphical and numerical solutions in structural analysis.
- 3312. Structural Graphics II (3:3:0).** Prerequisite: CTEC 3311. Graphical and numerical solutions in structural analysis.
- 3313. Foundations and Earthwork (3:3:0).** Prerequisite: GTEC 3311. Soil properties and the design of foundations for structures.
- 4311. Structural Design I (3:3:0).** Prerequisite: CTEC 3312. Design of reinforced concrete elements with detail drawings.
- 4312. Structural Design II (3:3:0).** Prerequisite: CTEC 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. Study of construction estimating from a cost accounting and resource productivity approach considering owner's feasibility study, pre-construction design cost, and contractor's bid.
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.
4346. **Cost Estimating II** (3:2:3). Prerequisite: CTEC 4342. Computer-aided construction estimating. Application of computer programs supporting a general contractor's quantity take-off computations, resource costing and allocation, and bid preparation to include pricing.

Courses in Electrical-Electronics Technology. (EET)

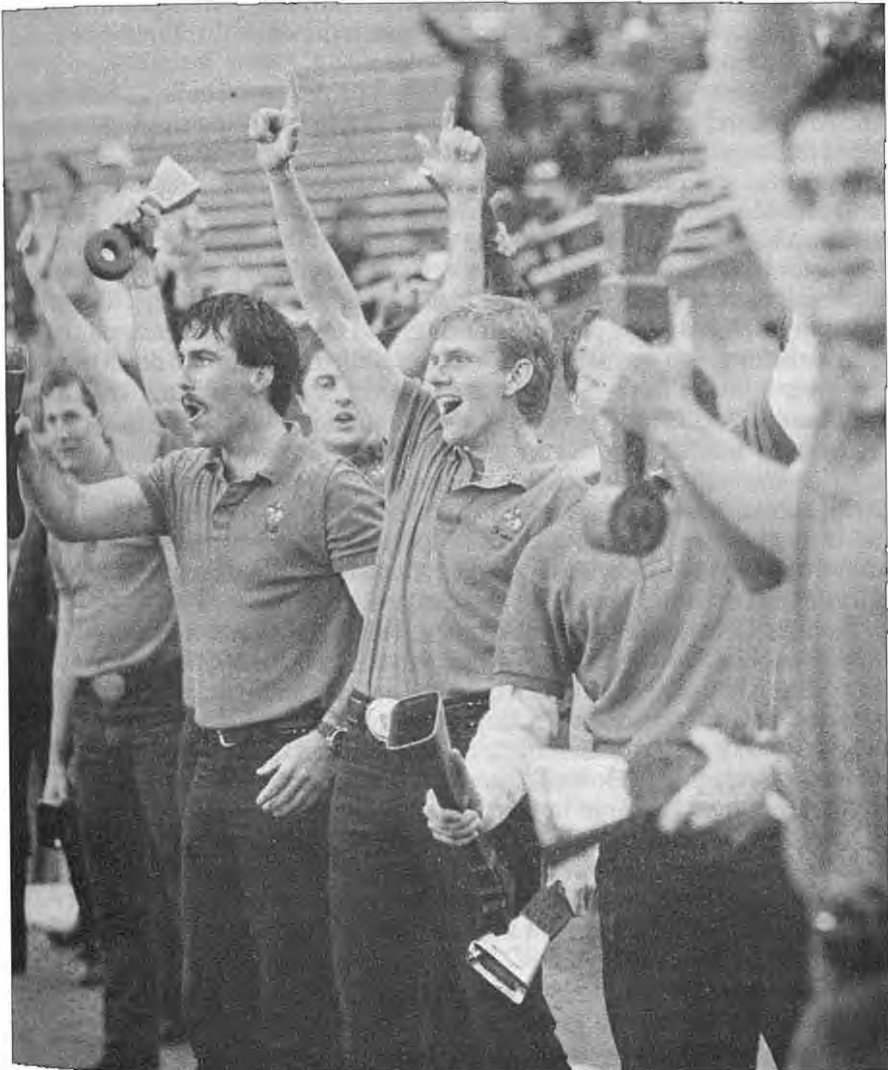
1312. **Principles of Electrical Technology** (3:3:0). Prerequisite: Concurrent enrollment in MATH 1350, GTEC 1311, consent of instructor. Fundamentals of direct and alternating current circuits.
2311. **Electrical Technology I** (3:3:0). Prerequisite: EET 1312 and concurrent enrollment in PHYS 1306, 1103, or approval of department chairperson. Fundamentals of circuit theory applied to active devices.
2312. **Electrical Technology II** (3:3:0). Prerequisite: EET 2311, GTEC 2321, and concurrent enrollment in PHYS 1307, 1104, EET 2314, or approval of department chairperson. Characteristics of active devices and electronic circuits.
2314. **Computer Technology** (3:3:0). Prerequisite: GTEC 1311, concurrent enrollment in EET 1312. An introduction to basic digital hardware, logic circuits, and computers.
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 2331, concurrent enrollment in EET 2312, 2314. 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: Concurrent enrollment in EET 2312. Applications of electronic devices in amplifiers, oscillators and communication circuits.
3312. **Electronics Technology II** (3:3:0). Prerequisite: EET 3311 or consent of instructor. A study of advanced and specialized communication systems and opto-electronics.
3321. **Circuits and Systems** (3:3:0). Prerequisite: EET 2312, 3311, MATH 1352. Advanced circuit theory with an introduction to system concepts and design.
3324. **Applications of Linear Integrated Circuits** (3:3:0). Prerequisite: EET 2312, 4314. 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, consent of instructor. A laboratory course to accompany first-semester junior courses in electrical-electronics technology.
3332. **Electronics Systems Lab I** (3:0:9). Prerequisite: EET 3331, concurrent enrollment in EET 3324, consent of instructor. A laboratory course to accompany second-semester junior courses in electrical-electronics technology.
4312. **High Frequency Techniques** (3:3:0). Prerequisite: EET 3311, 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 2312, 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 3324, 4314. 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: EET 3321, consent of instructor. A laboratory course to accompany first-semester senior courses in electrical-electronics technology.
- 4332. Special Electronics Projects (3:0:9).** Prerequisite: EET 4331; corequisite: EET 4353, consent of instructor. A laboratory to design and fabricate complete electronic systems. Accompanies second-semester senior courses in electrical-electronics 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 Technology. (MTEC)

- 1312. Mechanical 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: GTEC 2351. Evaluation of power and refrigeration cycles. The application of cycles and component equipment to refrigeration and power 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: MTEC 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 Technologist (3:0:6).** Prerequisite: E GR 1306. Technical and machine drafting, including the design and detailing of pipe systems and duct systems. Computer aided design and drafting (CADD) packages are used.
- 3322. Mechanical Technology Laboratory I (3:2:3).** Corequisite: MTEC 3312. Mechanical instrumentation and performance testing of heat power and refrigeration equipment.
- 4311. Air Conditioning System Design (3:3:0).** Prerequisite: MTEC 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: MTEC 3312. The thermodynamics of steam power stations. Analysis and design of turbines, auxiliary equipment, automatic controls, draft and fuel systems.
- 4321. Mechanical Technology Laboratory II (3:2:3).** Prerequisite: MTEC 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: MTEC 3322. Mechanical project laboratory. Design and/or analysis of engineering projects.

4332. **Specialized Topics in Mechanical Technology (3).** Prerequisite: Senior standing and consent of instructor. In-depth study of specialized topics of particular interest to the mechanical 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 1351 or 2322. Kinetic analysis and synthesis of cams, gears, and linkages. Applications to machine elements and assemblies.
4352. **Dynamics of Machinery (3:3:0).** Prerequisite: GTEC 2311, MTEC 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: GTEC 3311, MTEC 4341, MTEC 4351. Analysis of stresses and deformations in machine elements. Product analysis, design, development, and evaluation.



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, accredited by the American Home Economics Association and requiring 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 in Home Economics degree. Majors are offered in family financial planning and in clothing, textiles, and merchandising with specializations in fashion design, general clothing, and textiles and merchandising; food and nutrition with specialization in general dietetics; human development and family studies with specializations in human development, early childhood, and family studies; and general home economics with specializations in home economics teacher certification and interdisciplinary home economics. The college also offers the Bachelor of Science degree in Restaurant, Hotel, and Institutional Management and the Bachelor of Interior Design degree. For additional information about undergraduate degree programs in the various departments, see the following pages. Transfer students must have an overall GPA of 2.50 to be accepted into the College.

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 in Home Economics degree with majors in all departments; the Master of Science degree with a major in Gerontology; and a program leading to the Doctor of Philosophy degree in Home Economics. Specific information regarding graduate degrees may be found in the *Graduate Catalog*.

General Education Requirements. The University has established general education requirements for all students. These requirements will ensure breadth in each academic program.

Students should consult their academic dean regarding specific general education course requirements. Students are urged to seek advisement prior to their first enrollment to avoid losing credit. Students also may find a listing of General Education Requirements in the *Directory of Classes*.

Academic Counseling. Each student in the college is assigned an academic advisor according to departmental policy. Students who have not se-

lected a major will be assigned an advisor by the Associate Dean for Undergraduate Studies of the College of Home Economics.

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 79409-1162. The scholarship application deadline is February 15. Emphasis will be on leadership, service, high school and transfer grade-point averages, and test scores.

Selection of a Major. 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 a departmental advisor. Before the close of the junior year, students need to file Intent to Graduate forms in the dean's office and then follow the audited list of remaining courses.

Pass-Fail. A maximum of 13 hours may be taken pass-fail. The pass-fail option may be used only for elective courses. 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 University apply to the College of Home Economics. Additional requirements include the following:

1. Transfer students must have an overall 2.50 to be accepted into the College of Home Economics.

2. Required freshman-level and sophomore-level courses should be taken during the freshman and sophomore years.

3. 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).

4. 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.

5. Students must file a "Statement of Intention to Graduate" through the dean's office after completing 75 semester hours. After filing the application, the catalog designated for graduation cannot be changed. A receipt for diploma fee payment must accompany the filed intent form. Substitutions must be filed prior to or during the semester the student is enrolled for the 96th hour. A correspondence course cannot be used for graduation when completed during the student's final semester or summer term.

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.

7. All grades earned while enrolled at Texas Tech are used in calculating the grade-point average for meeting graduation requirements.

8. A candidate for a degree in the College of Home Economics should file a Personnel Data Form with the Placement Service.

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, textiles, and merchandising; family financial planning; food and nutrition; human development and family studies; or general home economics. Additionally, the college offers the Bachelor of Science degree in Restaurant, Hotel, and Institutional Management and the Bachelor of Interior Design degree. The general requirements of the College of Home Economics for all programs are summarized in the three groups below. In the following sections the special requirements for each program are indicated.

I. Academic Foundation: 49 to 61 semester hours

Required foundation courses: 6-12 hours of English including ENGL 1301, 1302; 2 hours of P.E., band, or nutrition activity; POLS 1301 and 2302; HIST 2300 and 2301. Check with a departmental advisor for specific requirements.

II. Home Economics Core: 8 semester hours

Required core courses include HDFS 3320, H E 4214, and a three credit-hour course specified by major department. Students must consult their respective departments regarding specific core course requirements for their major.

III. Additional required and elective courses as specified in major degree programs to complete the required semester hours for graduation. Students are urged to consult departmental advisors for advising and for copies of the most current degree plans in the departmental offices. (Degree programs vary in requirements from 129 to 145 semester hours.) The various areas of specialization meeting degree requirements are described by each department, followed by tables of specific course requirements.

Substance Abuse Studies. The colleges of Home Economics and Arts and Sciences jointly offer an interdisciplinary minor in substance abuse studies (SAS). This minor is designed for students with professional, academic, or personal interest in addictive disorders. It will provide students with an understanding of the physiological, psychological, societal, and familial factors contributing to addiction and the recovery from addiction.

For specific details, see the statement on Substance Abuse Studies in the College of Arts and Sciences section of this catalog.

Additional information may be obtained from the Program Director, Dr. Carl Andersen, Department of Human Development and Family Studies.

Department of Education, Nutrition, and Restaurant-Hotel Management

Associate Professor Lynn Huffman Director of the Center for Restaurant, Hotel, and Institutional Management; Professor Julian Spallholz, Director, Food and Nutrition Program; Associate Professor Anna Sue Couch, Director, Home Economics Education Program.

Professors Brittin, Harden, and Oberleas; Associate Professors Cho, Felstehausen, Fox, and Martin; Assistant Professors Boylan and Stout; Instructors Adams, Black, Clement, Crawford, Fitzgerald, Goh, Jones, Keefer, Kuret Ko, Perkins, Reeves, and Waters.

This department supervises the following degree programs: **GENERAL HOME ECONOMICS** and **FOOD AND NUTRITION**, *Bachelor of Science in Home*

Economics; Master of Science in Home Economics with specializations in Home Economics Education and Food and Nutrition; Doctor of Philosophy in HOME ECONOMICS with options in Home Economics Education and Food and Nutrition; RESTAURANT, HOTEL, AND INSTITUTIONAL MANAGEMENT, Bachelor of Science in Restaurant, Hotel, and Institutional Management, Master of Science in Restaurant, Hotel, and Institutional Management. A 10-1/2-month post-baccalaureate clinical dietetic internship, accredited by the American Dietetic Association (ADA), meets the ADA eligibility for dietetic registration.

General Home Economics Program

The General Home Economics program offers teacher certification in vocational home economics and general study in interdisciplinary home economics. Each specialization provides a broad background in all home economics subject areas and prepares students for a wide variety of career opportunities. Students take courses in human development, consumer economics, food and nutrition, housing and interior design, family studies, clothing and textiles, and resource management. The home economics certification course work meets Texas requirements for teacher certification in vocational home economics.

Home Economics Teacher Certification. The home economics teacher certification program is designed for students planning teaching careers in secondary vocational home economics, extension home economics, adult and community-based education, educational support services such as curriculum development and media, business, government, human services, and other fields. The program includes course work in all home economics content areas and the professional education courses required for vocational home economics teacher certification in Texas. The degree requirements have been revised recently to comply with legislative mandates. Approval of the program by state agencies is pending. See an academic advisor in Home Economics Education for current information.

Students seeking teacher certification must meet all requirements outlined in the Teacher Education section of this catalog. Admission requirements include completion of 60 semester hours with an overall grade-point average of 2.50 or higher; completion of 12 semester hours of English with a grade-point average of 2.25 or higher; and a satisfactory level of performance on a test of basic skills. Other requirements include a grade-point average of 2.50 or higher in professional education courses and a grade of C or higher in all required home economics courses. To be recommended for certification, graduates must achieve a satisfactory level of performance on an examination prescribed by the State Board of Education.

It is possible to become qualified to teach in a second teaching field by taking additional course work. A minor in mass communications, business, or other appropriate areas may be obtained by taking 18 semester hours in approved courses. For information about certification to teach in early childhood education, please see the certification requirements listed in the Human Development and Family Studies section.

Interdisciplinary Home Economics. The Interdisciplinary Home Economics specialization prepares students for careers in human services, extension home economics, business, government, communications, and other fields which require a broad home economics background. The program includes

course work in all home economics content areas. Students may expand career opportunities by selecting electives in support areas such as mass communications, business, or computer science. A minor may be obtained by taking 18 semester hours in approved courses. Qualified students may complete an internship during the senior year. A grade of C or higher is required for all home economics courses in the specialization.

Pre-Teaching Minor. The Pre-Teaching Minor is designed for students in any major in the College of Home Economics who plan to seek a Vocational Home Economics Teaching Certificate after completing a bachelor's degree. The minor allows undergraduate students to take 19 hours of the course work required for teacher certification, reducing the time needed to complete certification requirements after graduation. To be admitted to a teacher education program, one must have an overall GPA of at least 2.50 and achieve a satisfactory level of performance on a test of basic skills. Students who meet the requirements for admission to a graduate program may combine teacher certification requirements with work toward a master's degree. See an academic advisor in Home Economics Education for additional information.

General Home Economics Minor. The General Home Economics Minor is available to students in any major who desire a broad background in home economics. The minor includes 18 semester hours in course work representing the various home economics content areas. See an academic advisor in Home Economics Education for additional information.

General Home Economics Curriculum.

Home Economics Certification		Interdisciplinary Home Economics	
Basic Curriculum	Requirements for Certification	Basic Curriculum	Requirements for Specialization
FIRST YEAR			
ENGL 1301, 1302 MATH 1320 or above POLS 1301 COMS 2300 P.E.-2 sem.	C&T 1330, 2303 F&N 1410 H D 2303 FFP 2370	ENGL 1301, 1302 Fine Arts or Hum. elect. MATH 1320 SOC 1301 or 1320 POLS 1301 Nat. Sci. elect. (Lab.) P.E.-2 sem.	C&T 1330 or 2301 H D 2303 FFP 2370 or 2372
SECOND YEAR			
ENGL 2301 or 2302, 2309 HIST 2300, 2301 POLS 2302 EDIT 2318 ZOO 2403 Nat. Sci. elect. (Lab.) Math. elect.	H E 2102 F&N 2310	ENGL 2301 or 2302, 2309 HIST 2300, 2301 POLS 2302 ANTH 1301 or 1302 Math. elect. ZOO 2403 or BIOL 1402	F&N 1410 C&T 2303 F&N 2310
THIRD YEAR			
Gen. Ed. elect.-9 hrs. (May include courses that fulfill requirements for certification) Fine arts elect. Elective (fine arts, for. lang., math., hum., nat. sci., soc. sci.)	H E 3103 FFP 2372, 3370 C&T 3302 F S 3320 H D 3312, 3212 I D 3380 EDSE 3300 EPSY 3330 HEED 3301	COMS 3308	FFP 3370 H D 3310, 3210 or 3312, 3212 or 3314, 3214 I D 3380 HEED 3303 F&N elect. F S 3320 Minor or elect. -9 hrs.

FOURTH YEAR

H E 4102, 4103, 4214, 4302, 4306 C&T 4131 I D 4132 H D 4133 I D 4380 RHIM 3460 EDSE 4000 HEED 4301, 4304 F S elect. F&N 3310, 3340, 3350, or 4380	H E 4214 F&N 4310 HEED 3305, 4307 -6 hrs. H E 4102 FFP or I D elect. F S elect. H D or F S elect. Minor or elect.- 9 hrs.
TOTAL	137-145 hrs. 133 hrs.

Food and Nutrition Specialization

This program emphasizes the role of food and nutrition in the health and welfare of people. The specialization provides educated professionals for food science, nutrition, and dietetic careers in hospitals, schools, colleges, wholesale and retail food industries, and government agencies. Courses also contribute to the liberal education of all students who enroll in food and nutrition courses.

Food and Nutrition Curriculum.

Dietetics			
Basic Curriculum	Requirements for Specialization	Basic Curriculum	Requirements for Specialization
FIRST YEAR		SECOND YEAR	
ENGL 1301, 1302 CHEM 1305, 1306, 1101, 1102 POLS 1301 SOC 1320 or PSY 1300 MATH 1320 PE, Marching Band, ROTC, or Nutr-2 sem.	F&N 1410, 2310	POLS 2302 ECO 2305 ZOOL 2403, 2404 ANTH 2302 HIST 2300, 2301 COMS 2300 MBIO 3400 ENGL 2309	
THIRD YEAR		FOURTH YEAR	
CHEM 3303, 3303 FS 3320 HEED 3303 MGT 3370	F&N 3310, 3340 RHIM 3303, 3460, 3470	H E 4214 PHIL 3322 AECO 3401 Fine arts or hum. elect.	F&N 4000, 4120, 4130, 4320, 4330, 4340, 4341, 4360 RHIM 3490
TOTAL			133 hrs.

General Dietetics. The Plan IV General Dietetics Program at Texas Tech is approved by the American Dietetic Association (ADA) and is designed to furnish the student with an academic program which "provides for the achievement of knowledge requirements for entry-level dietitians" as outlined by ADA. After graduation from the Plan IV program, the student must complete an ADA accredited internship (such as the post-baccalaureate internship offered at Texas Tech) or approved preprofessional practice (ADA) program including 900 hours of supervised practice to gain performance skills needed to be an entry level dietitian. After completion of both programs, the student is eligible to take the dietetic registration examination and upon passing the exam become a registered dietitian (R.D.). General Dietetics emphasizes the nutritional care and education of people and prepares students to qualify for internships, graduate school, or positions in hospitals, community agencies, and food service systems with the prime responsibility of improving and maintaining the nutritional status of people.

Restaurant, Hotel, and Institutional Management Program

This program prepares students for career opportunities in the hospitality industry and includes courses in 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 classroom and laboratory experiences. The philosophy of the program is to prepare well-trained professionals for a creative and innovative industry.

The mission of the RHIM program is to support and enhance the purpose of the college and the University. The faculty and staff are actively committed to the discovery and dissemination of knowledge, skills, attitude, and overall professional and personal development of graduate and undergraduate students. To remain a current and viable contributor of knowledge, experience, and direction to students and to the hospitality industry, the faculty recognizes the importance on ongoing research, community service, and industry involvement.

Texas Tech's RHIM program, recognized by the *Nation's Restaurant News* as one of the top ten programs in the U.S., offers a multidisciplinary approach to hospitality education. The curriculum is designed to prepare the student to meet both current and future hospitality needs. The program emphasizes problem solving and creativity in addition to strong practical laboratory experiences. Transfer students must have an overall grade-point average of 2.50 or higher to be accepted into the RHIM program.

Restaurant, Hotel, and Institutional Management Curriculum.

Basic Curriculum	Requirements for Major	Basic Curriculum	Requirements for Major
FIRST YEAR		SECOND YEAR	
ENGL 1301 Sci.—4 hrs. P.E., Band, ROTC, or Nutr. RHIM 2110 HIST 2300 Math.—3 hrs.	ENGL 1302 Sci.—4 hrs. P.E., Band, ROTC, or Nutr. RHIM 2308 HIST 2301 Math.—3 hrs.	POLS 1301 F S 3320 RHIM 2322 F&N 2310 Elect.—3 hrs. Fine Arts elect.—3 hrs.	POLS 2302 ENRH 2312 ECO 2305 Humanities—3 hrs. Elect.—3 hrs. RHIM 3322
THIRD YEAR		FOURTH YEAR	
COMS 3308 RHIM 3460 FD T 3303 RHIM 3308 RHIM 3320	ID 3380 RHIM 3470 RHIM 3490 MGT 3374 RHIM 3341	RHIM 3350 RHIM 4312 RHIM 4313 RHIM 3303 Elect.—3 hrs.	RHIM 4100 RHIM 4315 RHIM 4316 H E 4214 Elect.—6 hrs.
Total		131 hrs.	

Courses in Education, Nutrition, and Restaurant-Hotel Management. (ENRH)

2312. Human Physiological Well-Being (3:3:0). Study and application of interdisciplinary concepts contributing to the physiological well-being of individuals and families and decision making relative to these concepts.

Courses in Home Economics. (H E)

2000. Special Studies (VI-6). A course for lower-level home economics majors for individual study or special problems.

- 2102. **Introduction to Home Economics (1:1:0).** Exploration of home economics programs in traditional and nontraditional settings, including home economics extension, adult education, business and community agencies, and public schools. Includes field experience.
- 3103. **Field Experience in Home Economics I (1:1:0).** Supervised observation and participation in home economics-related fields.
- 4102. **Professional Development in Home Economics (1:1:0).** Skills for professional development in home economics.
- 4103. **Field Experiences in Home Economics II (1:1:0).** Supervised observation and participation in home economics-related fields.
- 4214. **Home Economics Seminar (2:2:0).** Prerequisite: Home Economic majors only, senior standing. Integrative approach and professional orientation to societal issues, including public policy, ethics, cultural diversity, and global interdependence.
- 4302. **Professional Applications in Home Economics (3:3:0).** Application of home economics knowledge and skills in child development, clothing and textiles, family studies, food and nutrition, housing and interiors, and management and consumer economics.
- 4306. **Occupational Home Economics (3:3:0).** Application of home economics knowledge and skills in food service, home furnishings, clothing, child development, services for the elderly, and institutional and hospitality management.

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 and professional organizations. Includes motivational techniques, group dynamics, conducting meetings, and leading discussions.
- 3301. **Foundations of Home Economics Education (3:3:0).** Prerequisite: Junior standing and admission to teacher certification program or pre-teaching minor. Introduction to programs in secondary schools and other settings. Program development and teaching methods.
- 3303. **Educational Processes in Home Economics Professions (3:3:0).** Designed for nonmajors. Focus on the teaching-learning process in professional settings outside the traditional classroom.
- 3305. **Educational Technology in Home Economics (3:3:0).** Experience with media and microcomputers for teaching and related areas. Skill development, simulated activities, applications, and evaluation for home economics programs.
- 3325. **Educational Programming: Addiction Issues (3:3:0).** Prerequisite: F S 3325. Addiction issues affecting individuals and families in business, community and school settings. Emphasis on program development, implementation, and evaluation.
- 4000. **Individual Study (V1-6).** May be repeated for credit for up to 6 hours.
- 4301. **Student Teaching in Home Economics (3:3:0).** Prerequisite: Attainment of admission standards to student teaching. Supervised teaching in an approved secondary home economics program.
- 4304. **Instructional Management in Home Economics (3:3:0).** Concurrent with student teaching. Principles and procedures for managing the home economics classroom. Designed to support the student teaching experience.
- 4307. **Internship in Home Economics (3:3:0).** Prerequisite: Senior standing, HEED 3301 or 3303, EPSY 3330 or 3 hours of behavioral science. Supervised experiences in home economics positions in extension, business, or related areas. May be repeated for credit.
- 4601. **Student Teaching in Home Economics (6:6:0).** Attainment of admission standards to student teaching.

Courses in Food and Nutrition. (F&N)

- 1410. Nutrition and Food (4:3:2).** Science of nutrition and food as applied to everyday living. Designed to convey basic nutrition concepts as they apply to the individual students.
- 2310. Principles of Food Preparation (3:2:2).** Application of scientific principles to food preparation.
- 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.
- 3325. Nutrition, Diet Therapy, and Addiction (3:3:0).** Principles of nutrition and diet therapy as applied to frequently encountered health problems, especially as related to substance abuse.
- 3340. Human Nutrition (3:3:0).** Prerequisite: Human anatomy and physiology. Physiological functioning of nutrients, their availability, and emphasis on dietary adequacy; factors that affect diet and nutrition throughout the life cycle.
- 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.
- 4000. Individual Study (V1-6).** May be repeated for up to 6 hours credit.
- 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 people of various age groups in a community and the role of community agencies in health maintenance.
- 4340. Clinical Dietetics I (3:3:0).** Prerequisite or concurrent with F&N 4320. Physiological and biochemical abnormalities in obesity, diabetes, disorders of liver, cardiovascular, and digestive systems.
- 4341. Clinical Dietetics II (3:3:0).** Prerequisite: F&N 4340. Physiological and biochemical abnormalities in anemias, renal disorders, burns, traumas, complicated pregnancy, diseases of infancy.
- 4360. Experimental Methods with Food (3:1:6).** Prerequisite: F&N 2310 and general 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.

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 (3:2:2).** Prerequisite: RHIM 2110. Principles and practices of managerial functions relating to the operation of hotel and motel facilities.
- 2312. **Introduction to Beverage Management (3:3:0).** Principles and practices regarding the production, selection, storage, and serving of beverages. Includes hospitality industry dining room merchandising and promotion techniques.
- 2322. **Hospitality Control I (3:3:0).** Introduction to hospitality control devices needed to measure fiscal success. Includes computer applications in industry situation.
- 3303. **Computers in the Hospitality Industry (3:2:3).** Introduction to the computer and its uses in the hospitality industry. Includes computer operation, characteristics of hardware, software, and managerial interpretation of output.
- 3308. **Hotel Convention Sales and Catering Management (3:3:0).** Prerequisite: RHIM 2308. Emphasis on the function of convention sales and service departments related to hotel-motel operation. Explores factors involved in large group sales.
- 3320. **Facilities Management (3:3:0).** Prerequisite: RHIM 2110. Management principles and practices relative to the internal maintenance of public dining and lodging facilities. Systematic control of hospitality spaces to safeguard health and use available aesthetic values.
- 3322. **Hospitality Control II (3:3:0).** Prerequisite 2322. Application of fiscal control devices in the hospitality industry.
- 3341. **Hospitality Management (3:3:0).** Prerequisite: RHIM 2110. Factors involved in establishing hospitality operations, organization, administrative development, allocation of labor, and control. Examines hospitality organizations with emphasis on planning and problem analysis.
- 3350. **Travel and Tourism (3:3:0).** Prerequisite: ECO 2305 or equivalent. An analysis of the economic impact of travel and tourism in the hospitality industry, including demand for travel services and attraction development.
- 3460. **Food Systems Management I (4:3:4).** Prerequisite: F&N 2310 or consent of instructor. Application of scientific food preparation and management principles to quantity food production. Includes laboratory experience in quantity food facility.
- 3470. **Food Systems Management II (4:3:3).** Prerequisite: RHIM 3460. For RHIM, dietetic, and HEED majors only. Optimum use of human, financial, and material resources by managers. Laboratory experiences include commercial food preparation.
- 3490. **Development, Procurement, and Utilization of Resources (4:4:0).** Prerequisite: RHIM 3460 or consent of instructor. 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.
- 4000. **Individual Study (V1-6).** May be repeated for up to 6 hours credit.
- 4100. **Practicum (1:1:0).** Prerequisite: RHIM majors only, final semester, 300 hours of in-service training completed or consent of instructor. Leadership, professional ethics, and professional communication.
- 4312. **Beverage Control Management (3:3:0).** Prerequisite: RHIM 2110, 3460. Selection, storage, and service of beverages with emphasis on inventory control, sales promotion, and profits.
- 4313. **Legal Aspects of Hospitality Industry (3:3:0).** Prerequisite: RHIM 2110. 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).** Prerequisite: RHIM 3470, 3322, 4312, FDT 3303. Assumption of maximum responsibility of management of actual

food service operation based on sound managerial principles and successful food production and service techniques.

- 4316. Hospitality Management Marketing (3:3:0).** Prerequisite: RHIM 2308. 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 Human Development and Family Studies

Professor Nancy Bell, Chairperson.

Professors Fischer, Fowler, Haley, Jorgensen, Riley, and K. Wampler; Associate Professors C. Andersen, Pinder, Scott, Sorell, and Wagner; Assistant Professors E. Anderson, Broderick, Crawford, Glenn, Munsch, and R. Wampler; Adjunct Professors Davidson, McGhee, and Newfield.

This department supervises the following degree programs: **HUMAN DEVELOPMENT AND FAMILY STUDIES**, *Bachelor of Science in Home Economics* and *Master of Science in Home Economics*; *Doctor of Philosophy in HOME ECONOMICS* with options in Family Studies, Human Development, and Marriage and Family Therapy.

The Department of Human Development and Family Studies offers a wide range of courses in the areas of human development, interpersonal relations, family studies, substance abuse studies, and family therapy. 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.

Human Development and Family Studies Specializations

Human Development. The human development specialization is the study of human development from the prenatal period through adulthood. Opportunity is afforded in the Child Development Research Center for the student to observe and interact with infants, toddlers, and young children. The Center is accredited by the National Association for the Education of Young Children. Supervised experiences with community groups provide opportunities for interaction with older children and adolescents. Opportunities are available for course work in adult development and aging. 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, administration, and teaching in child care. Students who wish to continue their education into graduate school receive a broadly based study of human behavior and development. Students minoring in human development take 18 hours of course work. The specific courses should be selected in consultation with an advisor in the department and in consultation with updated degree plans available in the departmental office.

Human Development and Family Studies Curriculum.

Human Development		General Home Economics: Early Childhood (Option IV)	
Basic Curriculum	Requirements for Specialization	Basic Curriculum	Requirements for Specialization
FIRST YEAR			
ENGL 1301, 1302 POLS 1301 P.E.-2 sem. Individual or group-3 hrs. Math: College Algebra or above-3 hrs. Oral Comm.-3 hrs. Nat. Sci.-4 hrs. Humanities-3 hrs. Visual & performing arts -3 hrs.		ENGL 1301, 1302 ANTH 1301 POLS 1301 P.E.-2 sem. General Ed. Elect. -Humanities Gen. Ed. elect.-Nat. Sci. Math: Coll. Alg. or above -3 hrs. Gen. Ed. elect.-3 hrs.	
SECOND YEAR			
Math. and logical reason. -3 hrs. POLS 2302 HIST 2300, 2301 Technology-3 hrs. Nat. Science-4 hrs.	H D 2303 H D 2304 H D 3301 H D 3303 Minor or Collateral-3 hrs.	Oral Comm.-3 hrs. POLS 2302 HIST 2300, 2301 English-6 hrs. Math. and logical reason. -3 hrs. Nat. Science-4 hrs.	EDIT 2318 P E 2304 (or alternative) GEOG 2351 F&N 1410 H D 3301 CEED 2370 or FFP 3370
THIRD YEAR			
	F&N 3340 or 3350 HDFS 3390 †Human Dev. basic -6 to 12 hrs. †Prof. Preparation -0 to 8 hrs. Minor or collateral-6 hrs. F S elect.-3 hrs.		ART 3377 (or alternative) H D 3306 H D 3310 & 3210 H D 3312 & 3212 H D 3314 & 3214 F S 3320 F&N 3340 or 3350 F S or HDFS elect. -6 hrs. EDRD 3340 EDRD 3341 Visual & performing arts -3 hrs.
FOURTH YEAR			
	H E 4214 Minor or collateral-9 hrs. †Human Dev. basic-3 to 9 hrs. †Prof. Preparation-3 to 9 hrs. F S elect.-3 hrs.		EDEL 4550 (or alternative) H D 4310 or 4312 H D 4406 CEED elect.-3 hrs. H E elect.-3 hrs. Methods & student teach.-18 hrs.
TOTAL	129 hrs.		139 hrs.

(Minimum of 12 hours human development basics, minimum of 8 hours human development professional preparation; total of 29 hours for both.)

General Home Economics: Early Childhood (Option IV). Certification for teachers of young children from 3 years of age through the 6th elementary grade is offered with specialization in child development and professional development from early elementary education. The program meets current Texas requirements for teacher certification. See an academic advisor for updated certification requirements which may occur from recent legislative mandates. Also consult the section on Teacher Education in this catalog. If you want to teach home economics in secondary schools, please see the certification requirements in the Education, Nutrition, and Restaurant-Hotel Management section. Special endorsements may be obtained for special education and early childhood education for exceptional children.

Family Studies. Drawing on family research and theory, as well as other behavioral sciences, the family studies 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 methods of enriching personal and family living are important concerns of this family studies area. Updated degree plans are available in the departmental office.

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, extension, probation, and other human service specialties. Those students preparing for graduate work find the family studies specialization a sound base from which to continue the study of human development and the family.

Students minoring in family studies take HDFS 2320, F S 2322, 3320, and 9 hours of electives in family studies. A minor in Substance Abuse Studies is also available.

Human Development and Family Studies Curriculum.

Family Studies			
Basic Curriculum	Requirements for Specialization	Basic Curriculum	Requirements for Specialization
FIRST YEAR		SECOND YEAR	
ENGL 1301, 1302 Individual and group-3 hrs. Math.: College algebra or above-3 hrs. P.E.-2 sem. POLS 1301 Nat. Sci.-4 hrs. Humanities-3 hrs. Visual & performing arts -3 hrs. Oral communication-3 hrs.	ENRH 2312	Math. or logical reasoning -3 hrs. POLS 2302 HIST 2300, 2301 Technology-3 hrs. Nat. Sci.-4 hrs.	HDFS 2320 F S 3320
THIRD YEAR		FOURTH YEAR	
HDFS 3390 Human Dev. elect.-3 hrs. F S 3324 Fam. Studies elect.-15 hrs. Minor or collateral-6 hrs. MCEC 3313		F S 3322	HE 4114 F S 4331, 4332 HDFS 4320 or F S 4332 Fam. Studies elect. -6 hrs. Minor or collateral -12 hrs. H D elect.-6 hrs.
TOTAL			129 hrs.

Courses in Human Development and Family Studies. (HDFS)

- 2320. Basic Interpersonal Skills (3:2:3).** The study and application of interpersonal skills as they relate to various age levels and social contexts.
- 3331. Parenting (3:3:0).** Basic principles and skills for parent effectiveness. Includes strategies for inclusion of parents in the developmental-educational processes of the child.
- 3390. Research Methods in Human Development and Family Studies (3:3:0).** Prerequisite: F S 3320 or H D 3303 or consent of instructor. Introduction to methods of research in human development and family studies.

4320. **Research in Human Development and Family Studies (3:3:0).** Prerequisite: HDFS 3390 or consent of instructor. Supervised independent work in selected areas. May be repeated once for credit.

Courses in Human Development. (H D)

2303. **Life Span Human Development (3:3:0).** Introduction to the theories, processes, and enhancement of development for infants, young children, adolescents, and adults.
2304. **Developmental Life Crises (3:3:0).** A survey of the developmental implications of normative, critical life experiences which affect large numbers of people in today's society.
3210. **Laboratory Experiences with Infants and Toddlers (2:1:2).** Prerequisite or concurrent: H D 3310. Supervised experiences with infants and toddlers.
3212. **Laboratory Experiences with Young Children (2:1:2).** Prerequisite or concurrent: H D 3312. Supervised experiences with young children.
3214. **Laboratory Experiences with Later Childhood (2:1:2).** Prerequisite or concurrent: H D 3314. Supervised experiences with school age children.
3301. **Theories of Human Development (3:3:0).** Survey of theories of human development with emphasis upon their implications for parenting, program development, and services.
3303. **Strategies of Studying Human Development (3:3:0).** Review of the techniques used in the study of human development throughout the life span and direct experience with a variety of measurement strategies.
3306. **Child and Adolescent Guidance (3:3:0).** Prerequisite: H D 3301 or consent of instructor. Development of strategies for promoting self-discipline, creative capacities, and positive relationships with children and adolescents.
3310. **Prenatal and Infant Development (3:3:0).** Prerequisite: H D 3301 or consent of instructor. Study of how to promote the psychomotor, social-emotional, and cognitive-language development of infants from the prenatal period through the first two years in their interactions with caregivers, peers, and the environment.
3312. **Development of the Young Child (3:3:0).** Prerequisite: H D 3301 or consent of instructor. 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 (3:3:0).** Prerequisite: H D 3301 or consent of instructor. 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).** Prerequisite: H D 3301 or permission of instructor. Enhancing the psychosocial, social-emotional, and cognitive-language development of adolescents within their interactions with peers, adults, and the culture.
3317. **Problems of Adolescence (3:3:0).** Prerequisite: H D 3301 or permission of instructor. Overview of problems associated with the adolescent years and training in use of helping skills appropriate for adolescent populations.
3318. **Development in Young Adulthood (3:3:0).** Prerequisite: H D 3301 or permission of instructor. Examination of individual developmental processes during the transition to adulthood and the first two decades of adult life.
3319. **Development in Middle Adulthood (3:3:0).** Prerequisite: H D 3301 or permission of instructor. Examination of individual developmental processes from the midlife transition through the middle years of adult life.
4000. **Individual Study (V1-6).** May be repeated for up to 6 hours credit.
4133. **Occupational Child Care and Elderly Services (1:1:1).** For home economics teacher certification only. Development of competencies needed in occupations related to care for children and elderly services.

- 4310. Day Care Systems (3:3:0).** Prerequisite: H D 3310, 3312, 3314, or 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: H D 3110, 3112, 3114, or consent of instructor. Survey of commonly used instruments designed to assess developmental competencies.
- 4314. Practicum in Human Development (3).** Prerequisite: Senior standing and 9 hours of human development. Supervised experiences in established career-related positions; focus selected on basis of professional interest. May be repeated for credit.
- 4319. Seminar in Human Development (3:3:0).** Prerequisite: For majors or with consent of instructor. Synthesis of current approaches to the study of human development with summary of basic and applied research studies. Review of methodologies used in working with infants, young children, adolescents, and adults in 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: H D 3110, 3112, 3114, or 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 Studies. (F S)

- 2125. Seminar in Addiction (1:1:3).** Prerequisite: Consent of instructor. Philosophy and process of recovery from addiction. Intensive seminar and laboratory experience. May be repeated for credit.
- 2322. Courtship and Marriage (3:3:0).** Designed to consider the role of interpersonal relationships of dating, courtship, and marriage.
- 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: F S 3320 or consent of instructor; suggested that HDFS 3390 be taken prior to or concurrent with F S 3324. 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.
- 3325. Family Dynamics of Addiction (3:3:0).** An examination of the family system with specific reference to the causes and effects of chemical abuse and addiction.
- 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).** 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).** Needs that arise from changes in family relationships, living arrangements, income, and employment.
- 4000. Individual Study (V1-6).** May be repeated for up to 6 hours credit.

4325. **Treatment of Addictive Disorders (3:3:0).** Prerequisite: FS 3325 and PSY 4329 or consent of instructor. Survey of the current treatment philosophies and programs designed to assist individuals and families affected by addictive disorders.
4331. **Introduction to Interviewing and Counseling Principles (3).** Prerequisite: Consent of instructor. An experiential course with emphasis on developing skills which apply to interview situations. A problem-centered approach to family needs. May be repeated once for credit.
4332. **Practicum in Family Services (3).** Prerequisite or corequisite: FS 3322 and 4331 or 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.

Department of Merchandising, Environmental Design, and Consumer Economics

Associate Professor JoAnn Shroyer, Chairperson; Associate Professor Shelley Harp, Specialization Coordinator.
 Rockwell Professor Horridge; Associate Professors Ater, Gustafson, Khan, Morrow, Schrock, and Timmons; Assistant Professors Eberspacher, and Gentry; Instructor Kountz; Part-time Lecturers Pool, Rawls, and Wade.

The department supervises the following degree programs: CLOTHING, TEXTILES, AND MERCHANDISING and FAMILY FINANCIAL PLANNING, *Bachelor of Science in Home Economics* and *Master of Science in Home Economics*; *Doctor of Philosophy* in HOME ECONOMICS with options in Clothing, Textiles, and Merchandising and in Environmental Design and Consumer Economics; INTERIOR DESIGN, *Bachelor of Interior Design*. A student in another college may minor in this department by completing a minimum of 18 hours selected in conference with the department chairperson.

General Requirements. The B.S. and B.I.D. degree programs are separated into lower division (first and second years) and upper division (third and fourth years). Students remain in the lower division until they have completed courses designated as first and second year requirements, have earned at least 64 hours, and have at least a 2.00 cumulative GPA for all work at Texas Tech. The grade of C is a minimum requirement in all departmental and support courses for all majors in the department. Prerequisites for departmental courses are governed by the catalog in effect when the course is taken.

An internship is required of each student specializing in family financial planning, fashion design, interior design, and merchandising. The internship experience is jointly planned by the department and the student and is available in the fall and summer only. 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 for all internships. A laboratory fee is required.

For the internship in family financial planning—FFP 3190, 3370, 3374, 3375, 4378, FIN 4324, ACCT 3307. FFP 3190 is required the spring semester prior to enrollment in FFP 4307.

For the internship in fashion design—FADS 3000, 3190, 3306, 3307, 4302, C&T 3302, 4304. FADS 3190 is required the spring semester prior to enrollment in FADS 4390, 4391.

For the internship in interior design—ID 3190, 3380, 3384, 3385, 3386, ART 3325. ID 3190 is required the spring semester prior to enrollment in ID 4307.

For the internship in merchandising—a grade of C or higher must be earned in C&T 4304, MER 3190, 3360, 3370, 4350, 4360, 4370, MKT 3350, 3353, 4351, MGT 3370. MER 3190 is required the spring semester prior to enrollment in MER 4390, 4391.

Clothing, Textiles, and Merchandising Specializations

Fashion Design. A flexible curriculum is offered to develop creativity, to provide a background of knowledge of the fashion industry, and to relate apparel design to human needs. Custom design or design for mass production may be pursued as well as fashion promotion and consumer services. Electives enable the student to minor in art, foreign language, marketing, mass communications, or other subjects.

General Clothing and Textiles. The general clothing and textiles major is designed for those who desire a flexible course of study leading to a wide selection of clothing and textiles career options.

Merchandising. Merchandising combines a creative approach to problem solving with an understanding of business principles. Courses from the College of Business Administration provide the basics of business principles, while courses within the department focus on the interplay between consumers and industries as well as on merchandising and management functions.

Clothing, Textiles, and Merchandising Curriculum.

Fashion Design			
Basic Curriculum	Requirements for Specialization	Basic Curriculum	Requirements for Specialization
FIRST YEAR		SECOND YEAR	
ENGL 1301, 1302 Math. elect. C S 1300 P.E., Band, ROTC, or Nutr. -2 sem. PSY 1300	FADS 1301, 1302 C&T 2303 ART 1324, 1325	HIST 2300, 2301 Nat. sci. Lab.-8 hrs. POLS 1301, 2302	C&T 2301, 2302 FADS 2306, 2307
THIRD YEAR		FOURTH YEAR	
COMS 3308	FADS 30003 hrs. FADS 3306, 3307 C&T 3302, 4303 MER 3360 MGT 3370, 3371 *Elect.-3 hrs. (UL) FS 3320	ID 4383	HE 4214 FADS 3000-3 hrs. FADS 3190, 4390, 4391 FADS 4302, 4307 MER 4370 *Elect.-6 hrs. (UL) C&T 4304
TOTAL			130 hrs.
General Clothing and Textiles			
Basic Curriculum	Requirements for Specialization	Basic Curriculum	Requirements for Specialization
FIRST YEAR		SECOND YEAR	
ENGL 1301, 1302 MATH 1320 PHIL 2310 SOC 1301 P.E., Band, ROTC, or Nutr. -2 sem.	HDFS 2320 FADS 1301, 1302 C&T 1330 Elect.-3 hrs.	C S 1301 or 1302 HIST 2300, 2301 ZOOL 2403 or BIOL 1402 BIOL 1401 Hum. elect.-3 hrs.	C&T 2301, 2302, 2303 FADS 2307 Elect.-3 hrs.

THIRD YEAR		FOURTH YEAR	
POLS 1301, 2302 Elec arts elect.-3 hrs.	FADS 2306, 3307 C&T 3301 or 4331, 3304, 4303 MER 3360 HEED 3303 F S 3320	COMS 3308	H E 4214 C&T 4304 HEED 3305 F&N 4310 or JOUR 3316 C&T elect.-3 hrs. FADS elect.-3 hrs. MER elect.-3 hrs. *Elect.-12 hrs. (UL)
Total		135 hrs.	
*(UL) refers to upper level.			

Merchandising

Basic Curriculum	Requirements for Specialization	Basic Curriculum	Requirements for Specialization
FIRST YEAR		SECOND YEAR	
ENGL 1301, 1302 MATH 1330, 1331 SOC 1301 or 1320 Nat. sci. lab.-8 hrs. PE, Band, ROTC, or Nutr. -2 sem. POLS 1301	C&T 2301	Appl. sci. elect.-3 hrs. HIST 2300, 2301 COMS 2303 or 3308 ART 1370 POLS 2302	C&T 2302 ACCT 2300 ENGL 2309 ECO 2301, 2302
THIRD YEAR		FOURTH YEAR	
PHIL 3323	MER 3360, 3370 C&T 3301 or 4331 ISQS 2340 MKT 3350, 3353 MGT 3370 Elect. (upper level)-3 hrs. FFP 3370 FS 3320		HE 4214 MER 3190, 4390, 4391 MER 4350, 4360, 4370, 4380 C&T 4303, 4304 Dept. elect. (upper level)-3 hrs. Elect. (upper level) -3 hrs. MKT 4351
TOTAL		133 hrs.	

Family Financial Planning Major

Family Financial Planning. Students are prepared for careers in financial planning and counseling in private practice, financial institutions, and governmental and social agencies. The multidisciplinary plan includes courses in finance, accounting, economics, family studies, and psychology. Students will develop a solid academic background for graduate study in family financial planning and for certification programs as financial planners.

The program is certified by the International Board of Standards and Practices for Certified Financial Planners, Inc. The marks "CFP" and "Certified Financial Planner" are the most respected professional designations in the financial services industry. The mark "CFP" identifies a person who has met educational standards, passed the IBCFP Certified Financial Planner Examinations, satisfied a work experience requirement, and agreed to the IBCFP Code of Ethics.

Family Financial Planning Curriculum.

Family Financial Planning			
Basic Curriculum	Requirements for Major	Basic Curriculum	Requirements for Major
FIRST YEAR		SECOND YEAR	
ENGL 1301, 1302 MATH 1330, 1331 PSY 1300 Appl. sci. elect.-3 hrs. Fine arts elect.-3 hrs. P.E., Band, ROTC, or Nutr. -2 sem. HIST 2300	FFP 1370, 2370	Nat. Sci. lab.-8 hrs. POLS 1301, 2302 PHIL 2310 or 3323 HIST 2301	ENGL 2309 ACCT 2300, 2301 ISQS 2445
THIRD YEAR		FOURTH YEAR	
COMS 3308	ACCT 3307 FFP 2372 FFP 3370, 3374, 3375 ECO 2301, 2302 FS 3320 *Elect.-6 hrs. (UL)		HE 4214 FFP 3190, 4307, 4374, 4376, 4377, 4378 FS 3324 or 4331 FIN 3320, 4324 ECO 3323 PSY elect. (UL) -3 hrs. PSY 4321
TOTAL			134 hrs.

* (UL) refers to upper level.

Interior Design Program

The Bachelor of Interior Design program, accredited by the Foundation for Interior Design Education and Research (FIDER), provides a sound curriculum that prepares individuals to qualify as entry-level professional interior designers. The curriculum also may serve as preparation for continued study in graduate schools offering advanced degrees in interior design.

Students participate in a wide range of design experiences: lectures, studios, seminars, group presentations and discussions, professional critiques, field trips, and field experiences. Practical application of multidisciplinary principles to residential and nonresidential interior environments are emphasized.

Sophomore Portfolio Review. In the fall and spring semesters sophomores submit a portfolio with representative work from specific studio courses. In the event a "conditional" evaluation is received by a student, the portfolio is reviewed a second time by the interior design faculty. A consensus of opinion by the faculty is required for determining recommendations for the student. Within one semester following the sophomore portfolio review, students who receive "conditional" evaluations must have met the recommended conditions stated by the reviewers.

Senior Portfolio Review. During the senior year, and while enrolled in D 4004, students are required to present a portfolio to be reviewed by a jury of design professionals. This experience provides the student practice in critical thought applied to his or her work. Students receiving "conditional" evaluations must meet the recommended conditions stated by the reviewers.

Student Projects Policy. The Department of Merchandising, Environmental Design, and Consumer Economics reserves the right to retain, exhibit, and reproduce design projects submitted by students. Work submitted for grade is the property of the department and remains such until it is returned to the student.

Interior Design Curriculum.

Interior Design			
Basic Curriculum	Requirements for Major	Basic Curriculum	Requirements for Major
FIRST YEAR		SECOND YEAR	
MED 1301, 1302 incl. elec-3 hrs. EC 1301 or 1320 FES 1301, 2302 E. hard, ROTC, or Nutr. -3 sem.	ID 1380, 1382 ART 1324, 1325	Nat. sci. lab.-8 hrs. HIST 2300, 2301 ART 1310 or 1311 ART 1320 ENGL 2309	ID 2380, 2383 C&T 2301 FS 3320
THIRD YEAR		FOURTH YEAR	
CMGS 3308 ED 2305 FS 3325	ID 3380, 3381, 3382, 3383, 3384, 3385, 3386 ART 3325		HE 4214 ID 4004, 4380, 4383, 4384, 4385 ID 3190, 4307 MKT 3350 ARCH 3361-6 hrs. Art guided elect. -6 hrs.
TOTAL		134 hrs.	

Courses in Merchandising, Environmental Design, and Consumer Economics. (MCEC)

3313. **Environments for Living (3:3:0)**. Analysis of the human environment interface relative to clothing, housing, and food. Decision making regarding aesthetic, behavioral, and economic issues in an integrative approach to environmental design.

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 characteristics, yarn and fabric structure, color, and finish.
2302. **Introduction to Apparel Analysis and Evaluation (3:3:0)**. Prerequisite: C&T 2301. Introduction to quality control and costing of materials and labor of mass-produced apparel. Emphasis on U.S. apparel industry, retailer, and consumer.
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.
3301. **Textile Fabrics: Properties and Performance (3:1:4)**. Prerequisite: C&T 2301. Physical and chemical properties of fibers, fabrication characteristics, and physical testing of woven fabrics.
3302. **Dressmaker Tailoring (3:1:4)**. Prerequisite: C&T 1330 or 2301, and 2303.
3304. **Family Clothing (3:3:0)**. Basic philosophy of dress in the American culture; wardrobe planning and buying procedures for family members with emphasis on children's clothing.
3330. **Fashion Study (3:3:0)**. Fashion study and tours of manufacturing, fashion, or merchandising centers including professional visits to retail stores, design houses and textile factories, and cultural visits to museums and historical sites.
4000. **Individual Study (V1-6)**. May be repeated for up to 6 hours credit.
4131. **Occupational Clothing Services. (1:1:1)**. For home economics teacher certification only. Skill development in mass production, merchandising, fashion promotion, fashion coordination, and repair and alteration of clothing.

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.

4331. Contemporary Textiles for Nonapparel Use (3:2:2). Prerequisite: C&T 2301. Investigation of the characteristics and composition of contemporary textiles used in nonapparel items.

Courses in Family Financial Planning. (FFP)

1370. Introduction to Family Finance and Consumer Studies (3:3:0). Introduction to family and consumer concepts, including decision systems, consumer needs, financial goal achievement, use of financial services such as banking, credit, insurance, and consumer purchases.

2370. Family and Consumer Resource Management (3:3:0). Quality of life enhancement through management theory applied to family consumer resources; includes diversity of life styles, career opportunities, and on-site participation in professional settings.

2372. Consumer Problems (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.

3190. Professional Practices for Family Financial Planning (1:1:0). Prerequisite: Junior standing; enrollment precedes FFP 4307. Emphasis on the principles of professional practices focusing on ethics and effective managerial strategies and the relation of total curriculum to profession.

3370. Family Financial Planning (3:3:0). Principles of family financial planning and evaluation methods for credit, insurance, housing, investments, taxation, employee benefits, and estate planning.

3374. Family Retirement Planning (3:3:0). A foundation course involving retirement planning which includes personal and financial aspects of retirement.

3375. Family Risk Management (3:3:0). The study and use of techniques and methods to assist in family risk analysis and loss prevention throughout the family cycle.

4000. Individual Study (V1-6). May be repeated for up to 6 hours credit.

4307. Internship in Family Financial Planning (3:1:6). Prerequisite: Departmental approval and FFP 3190, 3370, 3374, 3375, 4378, FIN 4326, and ACCT 3307. Supervised intern experiences in established career-related positions. May be repeated for credit.

4374. Consumer Redress (3:3:0). Prerequisite: FFP 2372 or equivalent. Survey of function role, and methods of consumer redress procedures used in the marketplace.

4376. Family Financial Analysis (3:3:0). Family financial decision strategies for debt reduction and asset management. Preparation and presentation of financial counseling and planning cases.

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.

4378. Family Estate Planning (3:3:0). A foundation course involving family estate planning.

Courses in Interior Design. (I D)

1380. Introduction to Interior Design (3:3:0). A survey of basic principles, concepts, and processes relevant to planning residential and nonresidential environments.

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.

3380. **Interior Environmental Analysis (3:1:4)**. Prerequisite: I D 1382 or equivalent. **Skills** for interpreting and visualizing construction drawings. Course content includes environmental assessment of aesthetic principles.
3383. **Interiors II (3:1:4)**. Prerequisite: I D 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.
3390. **Professional Practices for Interior Design (1:1:0)**. Prerequisite: Junior standing; enrollment precedes I D 4307. Emphasis on the principles of professional practices focusing on ethics and effective managerial strategies and the relation of total curriculum to profession.
3390. **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. **Interior Design Support Systems (3:2:2)**. Survey of human factors including the luminous, sonic, and thermal environment as support systems which promote health, safety, comfort, human efficiency, productivity, and esthetics.
3382. **Period Furnishings I (3:3:0)**. Introduction to furniture concepts and features of distinction including earliest examples and progressing through the 17th century. Emphasis on the evolution of forms, relationships to previous periods, and implications for current design application.
3383. **Period Furnishings II (3:3:0)**. Introduction to furniture concepts and features of distinction including 18th, 19th, and 20th centuries. Emphasis on the evolution of forms, relationships to previous periods, and implications for current and future furniture and design applications.
3384. **Environmental Design I (3:1:4)**. Prerequisite: Junior standing and I D 3380 or concurrent enrollment. Successful completion of sophomore portfolio review. Problem formulation and data collection from field experiences utilizing appropriate techniques of programming analysis and presentation.
3385. **Environmental Design II (3:1:4)**. Prerequisite: Junior standing and I D 3380 or concurrent enrollment. Development and application of skills in specification writing, presentation, and problem solving.
3386. **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 business documents. Study of studio procedures—ethics, business, and legal aspects.
4000. **Individual Study (V1-6)**. May be repeated for up to 6 hours credit.
4004. **Environmental Design Seminar (V1-3)**. Prerequisite: Junior standing or consent of instructor. In-depth discussions and analysis of professional issues, concepts, and procedures affecting the environmental design profession.
4132. **Occupational Home Furnishings (1:1:1)**. For home economics teacher certification majors only. Skill development in home furnishings occupations.
4307. **Internship in Interior Design (3:1:6)**. Prerequisite: Departmental approval and I D 3190, 3380, 3384, 3385, 3386, ART 3325. Supervised intern experiences in established career-related positions. May be repeated for credit.
4380. **Contemporary Issues in Interior Design and Housing (3:3:0)**. A survey of interior design issues focusing on problems and alternatives confronting interior design professionals and housing consumers.
4383. **Computer Aided Design for Interiors (3:1:4)**. Prerequisite: I D 3381 or consent of instructor. Computer aided design and drafting for the designer of interiors. Specification writing, cost estimating, record keeping, and other uses of computers in the business of interior design are also covered.
4384. **Advanced Interiors I (3:1:4)**. Prerequisite: I D 3384 and 3385. Advanced experiences that use the design process for creative problem solving and that focus on interior construction, components and finishes, cabinet detailing, lighting, schedules, graphic presentation, and cost estimating.

- 4385. Advanced Interiors II (3:1:4).** Prerequisite: I D 3384 and 3385. Advanced experiences in nonresidential projects that integrate and extend knowledge and skills in problem solving, programming, design analysis, building codes, space planning, specification writing, millwork detailing, lighting, business procedures, graphics, and application of human factors.

Courses in Fashion Design. (FADS)

- 1301. Principles of Fashion Design (3:1:4).** Visual design elements and principles as applied to clothing design; conceptual definitions and analysis of each element and principles and their use in designing apparel.
- 1302. Fashion Drawing (3:1:4).** Fashion drawing as a communication tool in fashion design. The three components of fashion drawing—figure, garment, fabric—are presented and practiced in sequence to develop the student's fashion drawing skills.
- 2306. Flat Pattern Design I (3:1:4).** Prerequisite: C&T 2303 and FADS 2307. Application of basic flat pattern techniques in designing.
- 2307. Apparel Design I (3:1:4).** Prerequisite: FADS 1301 and 1302. Basic methods of apparel design and their interrelationships. Creative problems are solved through illustration, flat pattern, and draping half-scale figures.
- 3000. Creative Design (V1-3).** Prerequisite: C&T 2303, FADS 2307, and consent of department. Current technology and promotional methods applied to creative apparel designs. May be repeated for credit up to 12 hours.
- 3190. Professional Practices for Fashion Design (1:1:0).** Prerequisite: Junior standing; enrollment precedes FADS 4390 and 4391. Emphasis on developing, planning, and implementing strategies necessary for securing career positions in fashion design.
- 3306. Flat Pattern Design II (3:1:4).** Prerequisite: FADS 2306. Application of advanced flat pattern techniques in designing.
- 3307. Apparel Design II (3:1:4).** Prerequisite: FADS 2307 and ART 1324, 1325. Methods of creative expression and communication in intermediate apparel design.
- 4000. Individual Study (V1-6).** May be repeated for up to 6 hours credit.
- 4302. Draping for Fashion Design (3:1:4).** Prerequisite: FADS 2303, 2306, and 2307. Dress design interpreted through the technique of draping. Emphasis on designing, fabrication, and fitting.
- 4307. Apparel Design for Mass Production (3:1:4).** Prerequisite: FADS 3306 and 3307 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.
- 4390, 4391. Internship in Fashion Design (3:1:6 each).** Prerequisite: Departmental approval and FADS 3000, 3190, 3306, 3307, 4302, C&T 3302, 4304. Applied problems in fashion design emphasizing student participation in business and industry.

Courses in Merchandising. (MER)

- 3190. Professional Practices for Merchandising (1:1:0).** Prerequisite: Junior standing; enrollment precedes C&T 4390 and 4391. Emphasis on the principles of professional practices focusing on ethics and effective managerial strategies and the relation of total curriculum to profession.
- 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: A grade of C or higher in MER 3360, MATH 1330, 1331, ACCT 2300, ISQS 2340. Analyzing the inherent

practices of merchandising to reflect departmental capital and stock utilization keeping profits consistent with space, time, and money.

600. Individual Study (V1-6). May be repeated for up to 6 hours credit.

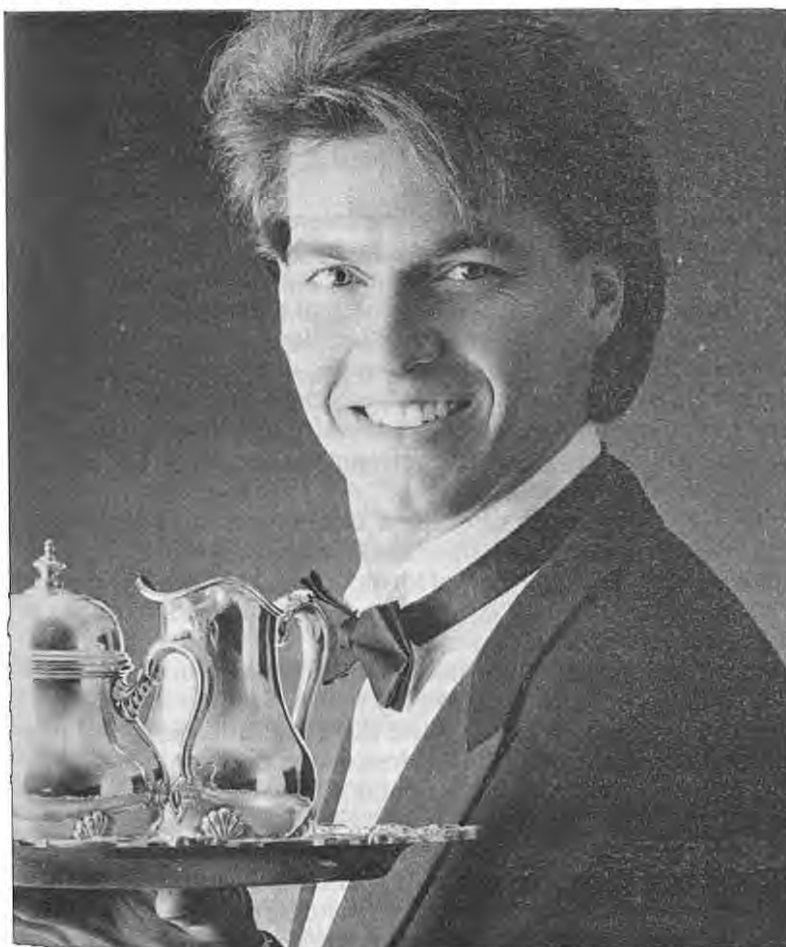
650. Problems in Merchandising of Clothing and Textiles (3). Prerequisite: MER 3360. Directed individual study through programmed learning with emphasis on problem solving using case studies and examples of merchandising enterprises.

660. Merchandise Management (3:3:0). Prerequisite: MER 3360, 3370, and MGT 3370, or consent of instructor. Fundamental principles related to the management processes of buying and selling hard and soft line products and supervising merchandising personnel.

670. Visual Merchandising Planning and Operations (3:2:2). Prerequisite: Junior standing or consent of instructor. Problems in communication through merchandise presentation, signage, display, store layout and design, advertising, and related media for careers in merchandising.

680. Textile and Clothing Economics (3:3:0). Prerequisite: A grade of C or higher in ECO 2311 and 2312 or equivalent and MER 3360. Study of economics of textile and clothing production and the world-wide market, with emphasis on the United States textile and apparel industry.

690, 4391. Internship in Merchandising (3:1:6 each). Prerequisite: Departmental approval and C&T 4304, MER 3190, 3360, 3370, 4350, 4360, 4370, MKT 3350, 3353, 4351, MGT 3370. Applied problems in merchandising emphasizing supervised student participation in business or industry.



Health Sciences Center

School of Allied Health

Professor Shirley McManigal, *Dean*

The Health Sciences Center School of Allied Health offers the following degrees: CLINICAL LABORATORY SCIENCE, *Bachelor of Science*; OCCUPATIONAL THERAPY, *Bachelor of Science*; PHYSICAL THERAPY, *Bachelor of Science*; and three levels of certification in Emergency Medical Services. All programs are fully accredited and include both didactic and clinical practice components in the curriculum.

Admission to School of Allied Health programs is competitive and by application to the school. Admission and application deadlines vary for each program. Inquiries and requests for applications should be directed to

Office of Student Services and Academic Affairs
School of Allied Health
Texas Tech University Health Sciences Center
Lubbock, TX 79430
(806) 743-3220

Admission to Texas Tech University does not confer admission to the Texas Tech University Health Sciences Center School of Allied Health. Nor does admission to the School of Allied Health confer admission to Texas Tech University.

Prospective students and other interested persons are encouraged to contact the Office of Student Services and Academic Affairs for information on health careers and educational programs.

Occupational Therapy. Occupational therapy is an integral component of the comprehensive health care, education, and rehabilitation of persons whose daily life patterns have been changed due to cognitive or developmental problems, injury, illness, social or emotional defects or the aging process. Interventions used by occupational therapy focus on helping individuals to achieve a health adapted balance between the important life tasks of work self-care, play and leisure, and rest.

Educational preparation for a career in occupational therapy is the baccalaureate degree. The occupational therapy program at Texas Tech requires students to complete two years of lower division courses at Texas Tech University or any accredited college or university followed by a two year upper division professional curriculum at Texas Tech University Health Sciences Center and a six month clinical internship. In addition to the regular curriculum, clerkships are scheduled concurrently with course work and allow the student to reinforce and test knowledge and skills presented in the classroom. At the successful completion of the professional program including internships, graduates are eligible to take the American Occupational Therapy Association examination for certification and apply for state licensure.

The curriculum is accredited by the American Medical Association in collaboration with the American Occupational Therapy Association.

Admission to the program is by application only. Students are considered for admission during the pre-professional and professional course work. Appli-

cation materials for the professional level are accepted each year beginning September 1. Closing dates are announced by the school each year. Applicants are strongly encouraged to obtain clinical experience by observation, voluntary service, or paid employment in occupational therapy or a related area. Class size is limited and all admissions are competitive.

Students who wish to know application closing dates and procedures or apply should contact the Office of Student Services and Academic Affairs at the School of Allied Health for information and forms. Additional information can be obtained from the department chairperson at 743-3240.

<i>Required Lower Division Courses</i>	<i>Sem. Cr. Hours</i>
ENGL 1301, Essentials of College Rhetoric	3
ENGL 1302, Advanced College Rhetoric	3
HIST 2300, History of the U.S. to 1877	3
HIST 2301, History of the U.S. since 1877 or	
HIST 3310, History of Texas	3
MATH 1320, College Algebra	3
MATH 1321, Trigonometry	3
CHEM 1307, Principles of Chemistry I	3
CHEM 1103, Principles of Chemistry I (Lab.)	1
BIOL 1403, Biology I	4
PSY 1300, General Psychology	3
PSY 3306, Personality	3
PSY 4301, Developmental Psychology	3
POLS 1301, American Government, Organization	3
POLS 2302, American Public Policy or	
POLS 3329, Ethnic Politics	3
PHYS 1306, General Physics I	3
PHYS 1103, Experimental General Physics I (Lab.)	1
ZOOL 2403, Human Anatomy and Physiology I	4
ZOOL 2404, Human Anatomy and Physiology II	4
SOC 1301, Introduction to Sociology	3
Sociology, Anthropology, Philosophy elective	3
Computer Science elective (prefer personal computer)	3
Elective	3
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Professional level courses are listed and described in the *School of Allied Health Bulletin*.

Clinical Laboratory Science. Medical technologists or clinical laboratory scientists perform diagnostic laboratory procedures in hospital, clinic or veterinary laboratories. Diagnostic analyses in hematology, chemistry, microbiology, immunology, and urinalysis yield information which is of vital importance in establishing a medical diagnosis.

The medical technology program at Texas Tech requires students to complete two years of lower division courses followed by a two-year upper-division professional curriculum at Texas Tech University Health Sciences Center. Admission is by application only. Transfer students may also apply.

The Department of Clinical Laboratory Science offers two options: a standard medical technology option and a premedical (dental, veterinary,

pharmacy) option. Students enrolled in the premedical option are assigned to a faculty advisor. Particular attention is given in the areas of course selection, MCAT preparation, recommendations, and personal expectations. Students enrolled under this option will also have the opportunity to observe various aspects of the TTU School of Medicine and the Health Sciences Center, such as lectures, laboratories, etc.

STANDARD MEDICAL TECHNOLOGY OPTION

<i>Required Lower Division Courses</i>	<i>Sem. Cr. Hours</i>
BIOL 1403, Biology I	4
BIOL 1404, Biology II	4
CHEM 1307, Principles of Chemistry I	3
CHEM 1103, Principles of Chemistry I (Lab.)	1
CHEM 1308, Principles of Chemistry II	3
CHEM 1104, Principles of Chemistry II (Lab.)	1
†CHEM 3103, Introductory Organic Chemistry (Lab.)	1
†CHEM 3303, Introductory Organic Chemistry	3
CHEM 3402, Physiological Chemistry	4
ENGL 1301, Essentials of College Rhetoric	3
ENGL 1302, Advanced College Rhetoric	3
HIST 2300, History of the U.S. to 1877	3
HIST 2301, History of the U.S. since 1877	3
POLS 1301, American Government, Organization	3
POLS 2302, American Public Policy	3
MATH 1320, College Algebra	3
MBIO 3401, General Microbiology	4
*Social Science elective	3
Social Science elective	3
†Elective	3
Elective	3
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††The chemistry requirement must include a minimum of one semester of organic or biochemistry. The remaining semester may include organic, biochemistry, or any chemistry course above the freshman level.

*Social science electives may be selected from the following: ANTH 1301, 2301, 2302; ECO 2305; PSY 1300; SOC 1301, 1320.

†Electives require chairperson approval.

Professional level courses are listed and described in the *School of Allied Health Bulletin*.

PREMEDICAL OPTION

<i>Required Lower Division Courses</i>	<i>Sem. Cr. Hours</i>
BIOL 1403, Biology I	4
BIOL 1404, Biology II	4
CHEM 1307, Principles of Chemistry I	3
CHEM 1103, Principles of Chemistry I Lab.	1
CHEM 1308, Principles of Chemistry II	3
CHEM 1104, Principles of Chemistry II Lab.	1
CHEM 3305, Organic Chemistry I	3

<i>Required Lower Division Courses</i>		<i>Sem. Cr. Hours</i>
CHEM 3105, Organic Chemistry I Lab.		1
CHEM 3306, Organic Chemistry II		3
CHEM 3106, Organic Chemistry II Lab.		1
ENGL 1301, College Rhetoric		3
ENGL 1302, Advanced College Rhetoric		3
HIST 2300, U.S. History to 1877		3
HIST 2301, U.S. History from 1877		3
MATH 1320, College Algebra		3
MBIO 3401, General Microbiology		4
PHYS 1103, General Physics I Lab.		1
PHYS 1104, General Physics II Lab.		1
PHYS 1306, General Physics I		3
PHYS 1307, General Physics II		3
POLS 1301, American Govt. and Organ.		3
POLS 2301, American Public Policy		3
*Social Science Elect.		3
†Elect.		3
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*Social science electives selected from the following: ANTH 1301, 2301, 2302; ECON 2305; PSY 1300; SOC 1301, 1320.

†Electives require chairperson approval.

Professional level courses are listed and described in the *School of Allied Health Bulletin*.

Students who wish to apply should contact the Office of Student Services and Academic Affairs at the School of Allied Health for information and forms.

Additional information can be obtained from Dr. Hal S. Larsen, department chairperson, at 743-3252.

Physical Therapy. Physical therapy is a health profession whose primary purpose is the promotion of optimal human health and function through the application of scientific principles to prevent, identify, assess, correct, and alleviate acute or prolonged movement dysfunction. Physical therapists—as members of the health care team—evaluate, treat, and instruct human beings to alleviate and/or limit physical disability, bodily malfunction, and pain from injury, disease, and other bodily conditions. Physical therapists may use physical elements such as heat, cold, sound, light, water, exercise, electricity, massage, mobilization, and positioning to reach patient goals.

Educational preparation for a career in physical therapy is the baccalaureate degree. Applications are accepted each year between September 1 and January 15 for admission into the class beginning the following June. Applications are due in the office of Student Services and Academic Affairs by January 15. All additional materials including the most recent transcripts and letters of reference are due by January 30. The professional curriculum encompasses two full years and begins in June of each year. Applications for admission may be submitted after completing a minimum of 40 hours. Students are required to obtain clinical experience by observation, voluntary service, or paid employment in physical therapy or a related health area. Class size is limited and all admissions are competitive. The program is accredited by the American Physical Therapy Association.

Students who wish to apply for transfer admission should contact the Office of Student Services and Academic Affairs in the School of Allied Health for information and forms. Additional information can be obtained from the department chairperson, Dr. H. H. Merrifield at 743-3226.

<i>Required Lower Division Courses</i>		<i>Sem. Cr. Hours</i>
ENGL 1301, Essentials of College Rhetoric		3
ENGL 1302, Advanced College Rhetoric		3
HIST 2300, History of the U.S. to 1877		3
HIST 2301, History of the U.S. since 1877 or		
HIST 3310, History of Texas		3
MATH 1321, Trigonometry		3
CHEM 1307, Principles of Chemistry I		3
CHEM 1103, Principles of Chemistry I (Lab.)		1
CHEM 1308, Principles of Chemistry II		3
CHEM 1104, Principles of Chemistry II (Lab.)		1
BIOL 1403, Biology I		4
BIOL 1404, Biology II		4
PSY 1300, General Psychology		3
†SOC 1301, Introduction to Sociology		3
†PSY 4301, Developmental Psychology		3
POLS 1301, American Government, Org.		3
POLS 2302, American Public Policy or		
POLS 3329, Ethnic Politics		3
PHYS 1306, General Physics I		3
PHYS 1103, Experimental General Physics I (Lab.)		1
PHYS 1307, General Physics II		3
PHYS 1104, Experimental General Physics II (Lab.)		1
ZOOL 2405, Vertebrate Structure and Development		4
ZOOL 4409, Comparative Animal Physiology		4
*C S 1300, Computers in Modern Society		3
Elective		5-6
		<hr/> 70-71

†for PSY 4305, 3304, 3327

†or PSY 2301, H D 2301

*or EDIT 2318, AGSC 2300

Additional prerequisites will be required for the entering 1992 class:

Statistics-3 hrs.

Speech-3 hrs.

Technical Writing-3 hrs.

Emergency Medical Services. Emergency Medical Services (EMS) technicians are health care professionals whose primary role is providing patient care in pre-hospital settings. EMS technicians respond to scenes of medical emergencies and accidents, assess patients found there, initiate treatment under written or verbal orders from a physician, and transport the patients to appropriate medical facilities. Life-saving care which otherwise would be available only in an emergency department is taken out of the hospital into the community.

The State of Texas recognizes four levels of certification for EMS technicians: Emergency Care Attendant, Emergency Medical Technician-Basic, Emer-

gency Medical Technician-Intermediate and Emergency Medical Technician-Paramedic. Certification examinations for all levels are administered by the Texas Department of Health. Emergency Medical Programs at Texas Tech University Health Sciences Center offers instruction which qualifies the student for each level of certification. All courses are approved by the Emergency Medical Services Division of the Texas Department of Health. The program is also fully accredited by the Committee on Allied Health Education and Accreditation of The American Medical Association.

To meet the needs of persons who wish to pursue careers in emergency medical services and those who wish to serve their communities as volunteers, Emergency Medical Programs offers courses both in Lubbock and in the surrounding 15-county region.

Two basic courses, one intermediate course, and one paramedic course are taught in Lubbock each year. These courses follow the academic calendar used by TTUHSC. Basic and intermediate courses are taught in other communities in the surrounding 15 counties when requested by local EMS organizations.

Additional information can be obtained from Mr. Neil Coker, the Program Director, at 743-3218. Courses are listed and described in the *School of Allied Health Bulletin*.

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. Texas Tech University Health Sciences Center has four campuses throughout West Texas. The School of Nursing offers a four-year *Bachelor of Science in Nursing* degree at the Lubbock campus and the upper two years for degree completion for registered nurses at the Permian Basin campus.

The School of Nursing campus in Lubbock 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 appropriate 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. The Permian Basin campus admits RNs only.

The degree program at the Health Sciences Center differs from most other nursing programs in the country because there are *no prerequisite college courses*. Nursing and nonnursing courses can be taken concurrently. Students are involved in direct clinical practice during their first semester of enrollment.

In Lubbock, 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 School of Nursing recog-

nizes 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. Entering freshmen are admitted in the fall and spring.

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. LVNs are admitted in the spring and summer.

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. RNs are admitted in the fall (Lubbock) and summer (Permian Basin).

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 and additional information by contacting:

Manager of Student Related Services
School of Nursing
Texas Tech University Health Sciences Center
Lubbock, Texas 79430
(806) 743-2737

Applicants (RNs) to the Permian Basin Campus should secure materials and additional information from

Administrative Assistant
School of Nursing
Texas Tech University Health Sciences Center
Permian Basin Campus
800 W. 4th St.
Odessa, Texas 79763
(915) 335-5150

Minimum Admission Standards.

Entering Freshmen

- (1) Graduation from an accredited high school.
- (2) Presentation of the following units of high school credit:

English	4
Mathematics	3

Social science	2-1/2
Foreign language	2
Lab. science	2
Electives	3-1/2

(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 Non-High School Graduate Test.)

(2) Graduation from a state-approved program in 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 in Texas.

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 in Texas.

Requests for applications and other information may be obtained in Room 3B-100, HSC Building.

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 School of Nursing and in the College of Arts and Sciences 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

1990-1991

(Date following rank indicates year of initial appointment to Texas Tech)

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J. FRED BUCY	Dallas
WENDELL MAYES, JR	Austin
WM. GORDON MCGEE, M.D.	El Paso

Term Expires January 31, 1993

REX FULLER	Lubbock
J.L. GULLEY, JR	Tyler
CAREY HOBBS	Waco

Term Expires January 31, 1995

RICHARD E. CAVAZOS	Leander
J.L. "ROCKY" JOHNSON	Irving
ALAN B. WHITE	Lubbock

Principal Administrative Officers

PRESIDENT ROBERT W. LAWLESS, Professor of Industrial Engineering and Information Systems and Quantitative Sciences, 1989.
B.S., Houston, 1964; Ph.D., Texas A&M, 1968.

EXECUTIVE VICE PRESIDENT AND PROVOST DONALD R. HARAGAN, Professor of Atmospheric Science and Geosciences, 1969.
B.S., Texas, 1959; M.S., Texas A&M, 1960; Ph.D., Texas, 1969.

VICE PRESIDENT FOR FISCAL AFFAIRS DON E. COSBY, 1989.
B.B.A., Texas Tech, 1977.

VICE PRESIDENT FOR GOVERNMENTAL RELATIONS JOHN MICHAEL SANDERS, 1971.
B.A., Abilene Christian, 1966; J.D., Texas Tech 1970.

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.

VICE PRESIDENT AND GENERAL COUNSEL DALE PAT CAMPBELL, JR., 1981.
B.S., Texas Tech, 1968; J.D., 1971.

Horn Professorships

Appointed 1968

HENRY J. SHINE, 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

WILLIAM J. CONOVER, Business Administration

MARION O. HAGLER, Electrical Engineering

Appointed 1983

DAVID LEON HIGDON, English

SHELBY D. HUNT, Business Administration

Appointed 1984

JAMES G. HUNT, Business Administration

Appointed 1985

JOHN F. WALKUP, Electrical Engineering

Appointed 1986

JOHN A. GILLAS, Music

J. KNOX JONES, JR., Biological Sciences

JANET W. PEREZ, Classical and Romance Languages

Appointed 1987

DAVID B. KNAFF, Chemistry

WALTER R. McDONALD, English

WILLARD B. ROBINSON, Architecture

Appointed 1988

RICHARD A. BARTSCH, Chemistry and Biochemistry

Appointed 1989

MARY JEANNE VAN APPLIEDORN, School of Music

Appointed 1990

RAYMOND C. JACKSON, Biological Sciences

ALLAN J. KUETHE, History

Teaching Faculty

- DONALD R. ABBE, Assistant Professor of History, 1985.
B.A., Texas Tech, 1972; M.A., 1974; Ph.D., 1982.
- VERONICA M. ACOSTA, Assistant Professor of Health, Physical Education, and Recreation, 1989.
B.S.N., St. Louis (Philippines), 1981; M.S., Wisconsin (Madison), 1984; Ph.D., 1989.
- CHARLES ADAMS, Instructor in Education, Nutrition, and Restaurant-Hotel Management, 1989.
B.G.S., Texas Tech, 1987; B.S., 1988.
- CHARLES LEONARD AINSWORTH, Professor of Education and Vice Provost for Academic Affairs, 1967.
B.A., Texas Tech, 1953; M.Ed., 1958; Ed.D., 1963.
- SUDQI ALAYYAN, Lecturer in Technology, 1984.
B.S., Texas Tech, 1977.
- 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.
- BONNIE L. ALLEN, Professor of Soils, 1959.
B.S., Texas Tech, 1948; M.S., Michigan State, 1951; Ph.D., 1960.
- EDWARD J. ALLEN, Assistant Professor of Mathematics, 1985.
B.S., Wisconsin-Madison, 1971; M.S., 1972; Ph.D., Tennessee, 1983.
- LINDA JOY SVOBODA ALLEN, Assistant Professor of Mathematics, 1985.
B.A., Coll. of St. Scholastica, 1975; M.S., 1978; Ph.D., Tennessee at Knoxville, 1981.
- RANDY D. ALLEN, Assistant Professor of Biology and Agronomy, Horticulture, and Entomology, 1989.
B.S., Southwestern Adventist Coll., 1978; M.S. Texas (Arlington), 1982; Ph.D., Texas A&M, 1986.
- CARL MADSENIUS ANDERSEN, Associate Professor of Human Development and Family Studies, 1965.
B.A., McMurry, 1957; Th.M., Perkins School of Theology, Southern Methodist, 1960; M.Ed., Texas Tech, 1970; Ph.D., Florida State, 1974.
- EDWARD E. ANDERSON, Professor and Chairperson, Department of Mechanical Engineering, 1986.
B.S.M.E., Iowa State, 1964; M.S.M.E., 1966; Ph.D., Purdue, 1972; Reg. Prof. Engr. (Iowa).
- EDWARD ROBERT ANDERSON, Assistant Professor of Human Development and Family Studies, 1989.
B.S., Illinois, 1984; M.A., Virginia, 1987; Ph.D., 1989.
- JOHN ARTHUR ANDERSON, Professor of Chemistry and Biochemistry, 1961.
B.S., Colorado State, 1952; M.S., 1954; Ph.D., Oregon State, 1962.
- LANE KENT ANDERSON, Professor of Accounting, 1978.
B.S., Brigham Young, 1965; M. Accy., 1966; M.B.A., Wisconsin (Madison), 1970; Ph.D., 1970; CPA, CMA.
- OWEN L. ANDERSON, Jack F. Maddox Professor of Law, 1988.
B.A., North Dakota, 1971; J.D., 1974.
- RONALD MYLES ANDERSON, Professor, and Chairperson 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.
- JOSEPH LESLIE ARANHA, Assistant Professor of Architecture, 1981.
B.Arch., Indian Inst. of Technology, 1978; M.Arch., Iowa State, 1981; Reg. Arch. (India).
- 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.
- CHARLES S. ARENI, Assistant Professor of Marketing, 1990.
B.A., Florida, 1985; Ph.D., 1990.

- MARION D. ARNOLD, Professor of Petroleum Engineering, 1984.
B.S., Texas A&M, 1958; M.S., 1959; Ph.D., 1967; Reg. Prof. Engr. (Oklahoma).
- SUE ARNOLD, Associate Professor of Music, 1971.
B.A., Campbell Coll., 1969; M.M., Illinois, 1971.
- JOYCE A. DAVIS ARTERBURN, Assistant Professor of Health, Physical Education, and Recreation, 1959.
B.S. in Ed., Texas Tech, 1954; M.Ed., 1966.
- CLIFFORD CHARLES ASHBY, Professor of Theatre Arts, 1963.
B.A., Iowa, 1950; M.A., Hawaii, 1953; Ph.D., Stanford, 1963.
- 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.
- SALLY LYNN ASKINS, Assistant Professor of Theatre Arts, 1989.
B.F.A., Stephen F. Austin State, 1975; M.A., 1977; M.F.A., Trinity, 1982.
- GEORGE B. ASQUITH, Professor of Geosciences, Adobe Chair of Petroleum Geology, 1988.
B.S., Texas Tech, 1961; M.S. Wisconsin-Madison, 1963; Ph.D., 1966.
- ELIZABETH CAROLYN ATER, Associate Professor of Merchandising, Environmental Design, and Consumer Economics, 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.
- CHARLES E. AULBACH II, Instructor in Geography, 1984.
B.A., St. Thomas, 1968; M.S., Troy State, 1978; M.S., Texas Tech, 1983.
- 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, Professor of English and Comparative Literature and Associate Chairperson, Department of English, 1969.
B.A., Texas Tech, 1962; M.A., 1965; Ph.D., South Carolina, 1969.
- MOHAMED MOHAMED AYOUB, Horn Professor of Industrial Engineering, 1961.
B.S.M.E., Cairo (Egypt), 1953; M.S.I.E., Iowa, 1955; Ph.D., 1964.
- THOMAS I. BACON, Associate Professor of German, 1974.
B.A., Texas Tech, 1963; M.A., Texas (Austin), 1967; Ph.D., 1970.
- DONALD JOSEPH BAGERT, Jr., Assistant Professor of Computer Science, 1988.
B.S., Tulane, 1977; M.S., Southwestern Louisiana, 1979; Ph.D., Texas A&M, 1986.
- BILL BASIL BAGLEY, Associate Professor of Art, 1973.
B.F.A., Phillips, 1962; M.F.A., Kansas, 1965.
- ROBERT JAMES BAKER, Horn Professor of Biological Sciences and Director, Natural Science Research Laboratory, 1967.
B.S., Arkansas A&M, 1963; M.S., Oklahoma State, 1965; Ph.D., Arizona, 1967.
- THOMAS E. BAKER, Professor of Law, 1979.
B.S., Florida State, 1974; J.D., Florida, 1977; Member State Bar (Florida).
- GAIL G. BARBER, 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, Associate Professor of English, 1982.
B.A., Texas (Austin), 1971; M.A., 1973; Ph.D., 1980.
- VARA SUE BARKER, Lecturer in English, 1985.
B.A., Texas, 1971; M.A., Virginia, 1973; Ph.D., Texas, 1984.
- ROGER W. BARNARD, Professor of Mathematics, 1973.
B.S., Kent State, 1965; M.S., 1968; Ph.D., Maryland, 1971.
- CALVIN GLENN BARNES, Associate Professor of Geosciences, 1982.
B.S., Nebraska (Lincoln), 1975; M.S., Oregon, 1978; Ph.D., 1982.
- CHESTER ALWYN BARR, Professor of History, 1969.
B.A., Texas (Austin), 1959; M.A., 1961; Ph.D., 1966.
- JAMES E. BARRICK, Associate Professor of Geosciences, 1980.
B.S., Ohio State, 1973; M.S., Iowa, 1975; Ph.D., 1978.

- PETER I. BARTA, Assistant Professor of Russian, 1986.
B.A., Eötvös (Budapest, Hungary), 1982; M.A., Illinois, 1983; Ph.D., 1987.
- RICHARD FLEMING BARTON, Professor of Business Administration, 1967.
B.S., Northwestern, 1948; Ph.D., California (Berkeley), 1961.
- RICHARD ALLEN BARTSCH, Horn Professor of Chemistry and Biochemistry, 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).
- BENJAMIN J. BATES, Assistant Professor of Mass Communications, 1989.
B.A., Pomona Coll., 1976; M.S., Wisconsin, 1978; M.A., Wisconsin (Stevens Point), 1981; Ph.D., Michigan, 1986.
- ALI BAYEGAN, Assistant Professor of Architecture, 1987.
B.Sc., Houston, 1974; M.Arch., 1979.
- KEITH BEARDEN, Associate Professor of Music, 1980.
B.M.Ed., Texas Tech, 1969; M.Ed., 1975.
- KLAUS BECKER, Assistant Professor of Economics, 1989.
Volkswirt (grad.), U. Hamburg, 1979; M.A., Kansas, 1980; Ph.D., 1987.
- WELDON EARNEST BECKNER, Professor of Education, 1965.
B.S., Wayland Baptist, 1955; M.Ed., Texas Tech, 1959; Ed.D., Colorado, 1966.
- NANCY J. BELL, Professor and Chairperson, Department of Human Development and Family Studies, 1974.
B.A., Allegheny, 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.
- DAVID A. BENDER, Adjunct Assistant Professor of Agronomy, Horticulture, and Entomology, 1984.
B.A., Goshen, 1970; M.S., Virginia Tech, 1981; Ph.D., 1984.
- HAROLD R. BENNETT, Professor of Mathematics, 1968.
B.S., Idaho State, 1963; M.A., Arizona State, 1965; Ph.D., 1968.
- SUE E. BENNETT, Lecturer in English, 1989.
B.A., Wayland Baptist, 1981; M.A., Texas Tech, 1985.
- WILLIAM FREDERICK BENNETT, Professor of Agronomy 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 Education and Director, Research and Training Center, 1971.
B.S., Arkansas Coll., 1947; M.A., Arkansas, 1948; 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).
- FRANCIS DAVID BERTRAM, Lecturer in Business Administration and Director of Academic Computing, 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, Associate Professor of Biological Sciences, 1978.
B.Sc., Otago (New Zealand), 1971; Ph.D., 1975.
- JOHN C. BILLING, JR., Assistant Professor of Landscape Architecture, 1989.
B.S., California State Polytechnic, 1972; M.L.A., 1977; M. Urban Planning, 1978.
- KENNETH D. BILTON, Lieutenant, USN, Assistant Professor of Naval Science, 1988.
B.S., Prairie View A&M, 1984.
- DAVID MARTIN BIRNEY, Assistant Professor of Chemistry and Biochemistry, 1989.
B.A., Swarthmore, 1978; M.Ph., Yale, 1987; Ph.D., 1987.
- BIRGIT BLACK, Instructor in Education, Nutrition, and Restaurant-Hotel Management, 1989.
A.O.S. in Occupational Studies-Culinary Arts, Culinary Inst. of America, 1986; B.S., Texas Tech, 1988.

- ERIC L. BLAIR, Associate Professor of Industrial Engineering, 1984.
B.S., Rensselaer Polytechnic Inst., 1969; M.B.A., Rochester Inst. of Technology, 1973; M.S., Rensselaer Polytechnic Inst., 1974; Ph.D., 1977; Reg. Prof. Engr. (Texas).
- JOHN D. BLAIR, Professor of Management, 1981.
B.A., Gustavus Adolphus, 1966; M.A., Michigan, 1972; Ph.D., 1975.
- LOWELL LAWRENCE BLAISDELL, Professor of History, 1957.
B.A., Elmhurst, 1941; M.A., Rochester, 1944; Ph.D., Wisconsin, 1949.
- ERIAN LAYTON BLAKELEY, Professor and Chairperson, Department of History, 1970.
B.S., Wisconsin State, 1962; M.A., Duke, 1964; Ph.D., 1966.
- RICHARD LAWRENCE BLANTON, Assistant Professor of Biological Sciences, 1988.
B.S., North Carolina-Chapel Hill, 1977; Ph.D., 1981.
- JOHN ROSS EDWARD BLIESE, Assistant Professor of Communication Studies, 1986.
B.A., Kearney State, 1966; M.A., Kansas, 1969; Ph.D., 1973.
- FRANCIS ELDON BLOOMER, Associate Professor of Education, 1971.
A.B., Wichita State, 1955; M.Ed., 1961; Ph.D., Ohio State, 1971.
- KIMBERLY B. BOAL, Associate Professor of Management, 1989.
B.S., California State (Los Angeles), 1970; M.B.A., Wisconsin-Madison, 1977; Ph.D., 1980.
- MACKIE BOBO, Lecturer in Education and Director, External Relations, College of Education, 1981.
B.S., Sam Houston State, 1965; M.A., 1972; Ed.D., Texas Tech, 1979.
- MIKE BOBO, Professor of Physical Education, 1970.
B.S., Sam Houston, 1966; M.A., 1967; Ph.D., Maryland, 1971.
- JAMES G. BOGLE, Professor of Music, 1976.
B.M., Baylor, 1971; M.M., Midwestern, 1973; Ph.D., Oklahoma, 1982.
- JOHN BORRELLI, Professor and Chairperson, Department of Agricultural Engineering, 1984.
B.S.A.E., Colorado State, 1965; M.S.A.E., 1967; Ph.D., Pennsylvania State, 1973.
- WALTER L. BORST, Professor and Chairperson, Department of Physics, 1984.
B.S., Tübingen (Germany), 1960; M.S., 1964; Ph.D., California (Berkeley), 1968.
- OSWALD DONIECE BOWLIN, Professor of Finance, 1965.
B.A., Texas A&M, 1951; M.S., 1954; Ph.D., Illinois, 1959.
- L. MALLORY BOYLAN, Assistant Professor of Food and Nutrition, 1986.
B.S., Alabama, 1975; M.S., 1978; Ph.D., Virginia Polytechnic Inst., 1986.
- JOHN ROSS BRADFORD, Professor of Chemical Engineering and Director, Center for Hazardous and Toxic Waste Studies, 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).
- LORETTA J. BRADLEY, Associate Professor of Education, 1987.
B.S., Kentucky, 1965; M.A., 1968; Ph.D., Purdue, 1975.
- MELVIN J. BRANCH, Instructor Part-time in Advertising, 1988.
B.F.A., Sam Houston State, 1972; M.F.A., 1975.
- 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 Information Systems, 1982.
B.A., Northeastern, 1966; M.A., 1969; Ph.D., Massachusetts, 1971.
- RONALD H. BREMER, Assistant Professor of Business Administration, 1988.
B.S., Mankato State, 1979; M.A., 1981; Ph.D., Texas A&M, 1987.
- CHARLES WILLIAM BREWER, Associate Professor of English, 1972.
B.A., Texas (Austin), 1964; M.A., 1967.
- RAYMOND D. BRIGHAM, Adjunct Professor of Agronomy, Horticulture, and Entomology, 1980.
B.S., Texas Tech, 1950; M.S., Iowa State, 1952; Ph.D., 1957.
- 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.
- CARLTON M. BRITTON, Professor of Range Management, 1980.
B.S., Texas Tech, 1968; M.S., 1970; Ph.D., Texas A&M, 1975.
- DOROTHY HELEN CLARK BRITTIN, Professor of Food and Nutrition, 1965.
B.S., Florida State, 1960; M.S., Texas Tech, 1965; Ph.D., 1974.

- KIMBERLY SUZANNE BRODERICK, Instructor in Health, Physical Education, and Recreation, 1988.
B.S., Western Illinois, 1983; M.S., Texas Tech, 1986.
- VICTOR K. BRODERICK, Assistant Professor of Human Development and Family Studies, 1987.
B.A., Southern California, 1980; M.S., Pennsylvania State, 1983; Ph.D., 1985.
- JAMES R. BROWN, Lieutenant, USN, Assistant Professor of Naval Science, 1988.
B.A., Texas Tech, 1983.
- LADY FALLS BROWN, Lecturer in English, 1989.
B.A., Texas Tech, 1964; M.A., Texas, 1968; Ph.D., Texas Tech, 1989.
- FRED C. BRYANT, 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, 1962; J.D., Washington, 1965; Member State Bar (Missouri).
- FRED BUDDINGH, Adjunct Professor of Animal Science and Education, Nutrition, and Restaurant-Hotel Management and Professor of Pathology, 1973.
D.V.M., Colorado State, 1951; Ph.D., California (Davis), 1969.
- 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 Agronomy, Horticulture, and Entomology, 1982.
B.S., Arizona State, 1973; M.S., 1975; Ph.D., Illinois, 1979.
- JOHN EDWARD BURKHARDT, Professor and Associate Chairperson, Department of Health, Physical Education, and Recreation, 1968.
B.A., Simpson, 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.
- JAMES R. BURNS, Professor of Management Science and Management Information Systems, 1973.
B.S.A.E., Colorado, 1966; M.S.A.E., Purdue, 1967; Ph.D., 1973; Reg. Prof. Engr. (Texas).
- JANE OFFUTT BURNS, Professor of Accounting and Frank M. Burke Chair in Taxation, 1986.
B.S.C., Louisville, 1961; M.B.A., 1966; Ph.D., Pennsylvania State, 1976; CPA.
- JOHN MITCHELL BURNS, Professor and Chairperson, Department of Biological Sciences, 1969.
B.S., New Mexico State, 1963; M.S., 1966; Ph.D., Indiana, 1969.
- GAYE BUSH-WINTER, Lecturer in English, 1985.
B.A., Eastern Kentucky, 1982; M.A., 1983.
- 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, 1974.
B.S., Central State (Oklahoma), 1963; M.A., Ohio State, 1969; Ph.D., 1972.
- ROBERT E. BYERLY, Associate Professor of Mathematics, 1980.
S.B., Massachusetts Inst. of Technology, 1973; M.A., State U. of New York (Buffalo), 1975; Ph.D., 1979.
- ROBERT GORDON CAMPBELL, Associate Professor of Anthropology, 1969.
B.A., Vanderbilt, 1953; M.A., Colorado, 1955; Ph.D., 1969.
- TRUDY A. CAMPBELL, Assistant Professor of Education, 1989.
B.S., Greenville Coll., 1975; M.S., Western Illinois, 1981; Ph.D., Illinois, 1989.
- ANN CLIFFORD CANDLER, Professor of Education, 1976.
B.S., Lamar, 1970; M.Ed., Houston, 1973; Ed.D., 1976.
- BILL W. CANTRELL, Lecturer in Architecture, 1967.
B.Arch., Texas Tech, 1951; Reg. Arch. (Arizona, Colorado, Oklahoma, New Mexico, Texas).
- JAIME F. CARDENAS-GARCIA, Associate Professor of Mechanical Engineering, 1988.
B.S.M.E., Maryland, 1971; M.S.M.E., 1975; Ph.D., 1983.
- PAUL H. CARLSON, Associate Professor of History, 1985.
B.A., Dakota Wesleyan, 1962; M.S., Mankato State, 1967; Ph.D., Texas Tech, 1973.
- REBECCA JAN CARNES, Lecturer in English, 1989.
B.A., Southwest Texas State, 1986; M.A., Texas Tech, 1989.
- HERBERT J. CARPER, JR., Professor of Mechanical Engineering, 1978.
B.S., Texas A&M, 1960; M.S., 1962; Ph.D., Arizona State, 1969; Reg. Prof. Engr. (Texas).

- ALLEN CARRIGO III, Lieutenant Colonel, U.S.A., Professor and Chairperson, Department of Military Science, 1989.
B.A., Texas A&M, 1967; M.B.A., Syracuse, 1975.
- RALPH M. CARTER, Associate Professor of Education, 1971.
B.A., Colorado, 1951; M.A., Middlebury, 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.
- DOMINICK JOSEPH CASADONTE, JR., Assistant Professor of Chemistry and Biochemistry, 1989.
B.S., Case Western Reserve, 1977; M.S., Purdue, 1980; Ph.D., 1985.
- WILLIAM R. CASTO, Professor of Law, 1983.
B.A., Tennessee (Knoxville), 1970; J.D., 1973; J.S.D., Columbia, 1983; Member State Bar (Tennessee).
- STANLEY EDWARD CEBULL, Professor of Geosciences, 1967.
A.B., California (Berkeley), 1957; M.A., 1958; Ph.D., Washington, 1967.
- MARVIN JOHN CEPICA, Professor of Agricultural Education and Mechanization and Associate Dean, College of Agricultural Sciences, 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.
- 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.
- LELAND CHANDLER, Research Scientist and Lecturer in Entomology, 1986.
A.B., Hanover, 1950; M.S., Purdue, 1951; Ph.D., 1955.
- CHIA-BO CHANG, Associate Professor of Atmospheric Science, 1984.
B.S., National Taiwan, 1966; M.S., South Dakota School of Mines, 1970; Ph.D., Florida State, 1980.
- KWONG SHU CHAO, Professor and Associate Chairperson, Department of Electrical Engineering, 1968.
B.S. in E.E., Cheng Kung, 1962; M.S., 1964; M.S., Rice, 1967; Ph.D., 1968.
- DAVID W. CHAPMAN, Assistant Professor of English, 1986.
B.A., Oklahoma, 1976; M.A., Tulsa, 1981; Ph.D., Texas Christian, 1985.
- SANKAR CHATTERJEE, Professor of Geology and Museum Science and Curator of Vertebrate Paleontology, 1979.
B.S., Jadavpur (Calcutta), 1962; M.S., 1964; Ph.D., Calcutta U., 1970.
- ELIVIERIO CHAVEZ, Assistant Professor of Romance Languages, 1985.
B.A., New Mexico, 1972; M.A.T.S., 1974; Ph.D., 1984.
- 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.
- PAUL H. CHENEY, Professor and Area Coordinator, Information Systems and Quantitative Sciences, 1988.
B.B.A., Minnesota, 1968; M.P.A., SUNY at Albany, 1972; Ph.D., Minnesota, 1977.
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B.S., Northwestern, 1971; M.S., Texas (Arlington), 1973; Ph.D., Auburn, 1980; Reg. Prof. Engr. (Texas).
- JIMMY H. SMITH, Professor of Civil Engineering and Director, Murdough Center for Professionalism in Engineering, 1963.
B.S., Texas Tech, 1962; M.S., 1963; Ph.D., Arizona, 1968; Reg. Prof. Engr. (Texas).
- KIM CLIFTON SMITH, Associate Professor of Art, 1980.
B.A., Washington, 1966; M.A., California (Berkeley), 1969; Ph.D., Brown, 1983.
- LOREN M. SMITH, Associate Professor of Wildlife Management, 1984.
B.S., Northeast Missouri State, 1977; M.S., South Dakota State, 1980; Ph.D., Utah State, 1983.
- MILTON LOUIS SMITH, Professor of Industrial Engineering, 1968.
B.S., Texas Tech, 1961; M.S., 1966; Ph.D., 1968; Reg. Prof. Engr. (Texas).
- ROSSLYN M. SMITH, Associate Professor of Romance Languages, 1979.
B.A., New Mexico, 1968; M.A., Wisconsin, 1970; Ph.D., New Mexico, 1975.
- TOMMY VAN SMITH, Assistant Professor of Mass Communications, 1989.
B.A., Georgia, 1978; M.S., Southern Mississippi, 1987; Ph.D., 1989.
- JEFFREY ROGER SMITTEN, Professor and Chairperson, Department of English, 1972.
B.A., California (Berkeley), 1963; M.A., 1966; Ph.D., Wisconsin (Madison), 1972.
- MASON H. SOMERVILLE, Professor of Mechanical Engineering and Dean of the College of Engineering, 1984.
B.S.M.E., Worcester Polytechnic Inst., 1964; M.S.M.E., Northeastern, 1966; Ph.D., Pennsylvania State, 1972.
- ELIZABETH WINKLER SOMMERLAD, Assistant Professor of English, 1986.
B.A., Smith, 1961; M.A., Free U. of Berlin, 1967; Ph.D., 1976.
- GWENDOLYN T. SORELL, Associate Professor of Human Development and Family Studies, 1983.
B.A., Goddard, 1976; M.S., Pennsylvania State, 1979; Ph.D., 1981.
- GEORGE W. SORENSEN, Professor of Theatre Arts, 1976.
B.A., Baylor, 1957; M.A., Colorado, 1966; Ph.D., Missouri (Columbia), 1976.
- RITCH L. SORENSON, Associate Professor of Management, 1986.
Brigham Young, 1973; M.A., 1975; Ph.D., Purdue, 1979.
- RONALD EUGENE SOSEBEE, Professor of Range Management, 1969.
B.S., Abilene Christian, 1964; M.S., New Mexico State, 1966; Ph.D., Utah State, 1970.
- DANA MARK SOUCY, Lecturer in English, 1989.
B.A., Howard Payne, 1983; M.A., Texas Tech, 1989.
- VIRGINIA M. SOWELL, Professor of Education and Associate Vice President for Academic Affairs, 1976.
B.A., Sam Houston State, 1951; M.A., Trinity, 1957; Ph.D., Texas (Austin), 1975.
- JULIAN SPALLHOLZ, Professor and Director of Food and Nutrition, 1978.
B.S., Colorado State, 1965; M.S., 1968; Ph.D., Hawaii, 1971.
- WILLIAM EARL SPARKMAN, Professor of Education, 1981.
B.A., Florida, 1969; M.Ed., 1973; Ed.S., 1974; Ph.D., 1975.
- MARK SPITZGLAS, Associate Professor of Architecture, 1988.
B.Sc., Ben-Gurion (Israel), 1972; B.Arch., Israel Inst of Technology, 1976; M.Sc., 1978; D.Sc., 1982.
- BRIAN D. STEELE, Assistant Professor of Art, 1988.
M.A., Iowa, 1983; Ph.D., 1988.

- JAMES McLEOD STEELE, Associate Professor of Architecture, 1989.
B.A., Lafayette, 1965; B.Arch., Pennsylvania, 1968; M.Arch, 1970; Reg. Arch. (Pennsylvania).
- EDWARD I. STEINHART, Associate Professor of History, 1984.
B.A., City Coll. of New York, 1963; M.A., California (Los Angeles), 1965; Ph.D., Northwestern, 1971.
- THOMAS L. STEINMEIER, 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.
- MICHAEL P. STEVENS, Assistant Professor of Education, 1989.
B.S., North Texas State, 1972; M.Ed., Southwest Texas State, 1975; Ed.D., East Texas State, 1989.
- ROBERT A. STEWART, Associate Professor of Communication Studies, 1984.
B.S., Lubbock Christian, 1980; M.A., Texas Tech, 1981; Ed.D., West Virginia, 1984.
- JOHN ALBRIGHT STINESPRING, Assistant Professor of Art, 1989.
B.A., Duke, 1958; M.S. in Ed., Indiana, 1961; Ph.D., Texas Tech, 1989.
- JANET A. STOCK, Lieutenant, USN, Assistant Professor of Naval Science, 1987.
B.A., Pittsburgh, 1977; M.A., Texas A&M, 1983.
- LAURA STOFFREGEN, Instructor in Health, Physical Education, and Recreation, 1986.
B.S., Texas Tech, 1981; M.E., 1983.
- MICHAEL STOUNE, Professor of Music, 1973.
B.M., Texas (Austin), 1962; M.M., 1965; D.M.A., Michigan (Ann Arbor), 1972.
- BETTY LEE STOUT, Assistant Professor of Home Economics Education, 1985.
B.S., Fairmont State, 1968; M.S., West Virginia U., 1971; Ph.D., Iowa State, 1977.
- LORUM H. STRATTON, Associate Professor of Romance Languages, 1969.
B.A., Brigham Young, 1963; M.A., Arizona, 1967; Ph.D., 1971.
- MONTY JOSEPH STRAUSS, Professor of Mathematics and Adjunct Associate Dean of the Graduate School, 1971.
B.A., Rice, 1967; Ph.D., Courant Inst. of Mathematical Sciences (New York U.), 1971.
- CAROL STRAWDERMAN, Assistant Professor of Education, 1989.
B.S., North Texas, 1961; M.A., Kansas, 1969; Ph.D., New Mexico, 1988.
- BETTY ANN STREET, Associate Professor of Art, 1967.
B.S., Tennessee, 1958; M.S., 1959.
- MARC R. STROMBERG, Assistant Professor of Mathematics, 1988;
B.S., Utah; Ph.D., 1988.
- JEFF A. STUYT, Associate Professor of Health, Physical Education, and Recreation, 1979.
B.A., Wageningen (Holland), 1973; M.S., 1975; Ph.D., Texas A&M, 1979.
- 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.
- STEVE G. SUTTON, Assistant Professor of Accounting, 1987.
B.S.A., Missouri (Columbia), 1982; M.A., 1984; Ph.D., 1987.
- JEANNE SWAFFORD, Assistant Professor of Education, 1989.
B.S., Middle Tennessee State, 1974; M.Ed., 1977; Ed.D., 1985; Ph.D., Georgia, 1989.
- ROBERT M. SWEAZY, Professor of Civil Engineering and Vice Provost for Research, 1970.
B.A., Wichita State, 1962; M.S., 1966; Ph.D., Oklahoma, 1970; Reg. Prof. Engr. (Texas).
- MARY K. TALLENT, Assistant Professor of Education and Associate Director, Continuing Education, 1985.
B.S., Houston, 1971; M.S., Southern Illinois, 1974; Ph.D., Texas A&M, 1985.
- METIN TAMKOC, Professor of Political Science, 1964.
LL.B., Istanbul, 1950; M.A., Maryland, 1955; Ph.D., Georgetown, 1960; Dr.H.C., Karadeniz Teknik Universitesi, 1988.
- DONALD R. TANNER, Associate 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.
- ROMAN M. TARABAN, Assistant Professor of Psychology, 1989.
B.A., Illinois, 1975; M.A., Chicago, 1981; Ph.D., Carnegie Mellon, 1988.

- J. DALTON TARWATER, Professor of Mathematics, 1968.
B.S., Texas Tech, 1959; M.A., New Mexico, 1961; Ph.D., 1965.
- HOWARD M. TAYLOR, Rockwell Professor of Agronomy, Horticulture, and Entomology, 1982.
B.S., Texas Tech, 1949; Ph.D., California (Davis), 1957.
- 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 Acting Chairperson, Department of Agronomy, Horticulture, and Entomology, 1968.
B.S., Louisiana Tech, 1952; M.S., Georgia, 1957; Ph.D., Louisiana State, 1963.
- 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 of Architecture, 1959.
B.Arch., Texas Tech, 1954; M.S. in Urban Planning, Columbia, 1963.
- LESLIE D. THOMPSON, Visiting Assistant Professor of Animal Science, 1986.
B.S., Florida, 1980; M.S., 1983; Ph.D., 1986.
- VIRGINIA MAHALEY THOMPSON, Associate Professor of Architecture, 1964.
B. of Adv. Art and Design, Texas Tech, 1959.
- ASHTON G. THORNHILL, Associate Professor of Photocommunication, 1979.
B.B.A., Texas Tech, 1971; M.A., 1974.
- HARLAN G. THORVILSON, Associate Professor of Entomology, 1984.
B.A., Luther, 1967; M.S., Iowa State, 1969; Ph.D., 1984.
- POLLY COOK TILTON, Assistant Professor of Biological Sciences, 1947.
B.S., Texas Tech, 1947; M.S., 1951.
- MYRA BOWNDIS TIMMONS, Associate Professor of Merchandising, Environmental Design, and Consumer Economics, 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).
- LINDA DARLENE TODD, Lecturer in English, 1989.
B.S., Texas Tech, 1974; M.A., 1989.
- RICHARD EARL TOLLEY, Professor of Music, 1959.
B.S., Illinois, 1955; M.S., 1959.
- IDRIS RHEA TRAYLOR, JR., Associate Professor of History, Executive Director, Office of International Affairs, and Director, International Center for Arid and Semi-Arid Land Studies, 1965.
B.A., Texas (Austin), 1957; M.A., 1959; Ph.D., Duke, 1967.
- THOMAS F. TROST, Professor of Electrical Engineering, 1970.
B.S.E.E., Case Inst. of Technology, 1964; M.S.E.E., 1966; Ph.D., 1969; Reg. Prof. Engr. (Texas).
- BEN B. TROTTER, Lecturer in Accounting, 1982.
B.B.A., Texas A&M, 1959; M.B.A., Harvard, 1963; CPA.
- ROGER MONROE TROUB, Professor of Economics, 1967.
B.B.A., Oklahoma, 1962; M.A., 1967; Ph.D., 1968.
- DAVID G. TROYANSKY, Associate Professor of History, 1984.
B.A., Carleton, 1976; M.A., Brandeis, 1978; Ph.D., 1983.
- YUNG-MEI TSAI, Professor of Sociology and Statistics, 1973.
B.L., Tunghai U. (Taiwan), 1963; M.A., Hawaii, 1967; M.A., Pittsburgh, 1970; Ph.D., Colorado, 1973.
- RICHARD M. TSE, Assistant Professor of Mathematics, 1988.
B.S., Harvey Mudd, 1984; Ph.D., Southern California, 1988.
- 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.
- DAN R. UPCHURCH, Adjunct Assistant Professor of Agronomy, Horticulture, and Entomology, 1986.
B.S., New Mexico State, 1978; M.S., California-Davis, 1980; Ph.D., Texas Tech, 1985.

- LLOYD VICTOR URBAN, Professor of Civil Engineering, 1969.
B.S., Texas (Austin), 1965; M.S., 1966; Ph.D., 1971; Reg. Prof. Engr. (Texas).
- C. V. GIRIJA VALLABHAN, 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 APPLIEDORN, Horn 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; Reg. Prof. Engr. (Texas).
- BETTY M. VAN NESS, Lecturer in Music, 1976.
- MIHAI A. VASILACHE, Assistant Professor of Petroleum Engineering, 1984.
B.S. in Petr. Engr., Inst. of Oil and Gas (Romania); M.S. in Petr. Engr., 1980.
- MARY ANN VAUGHAN, Associate Professor of Music, 1967.
B.M.E., Eastern New Mexico, 1955; M.M., Arizona, 1966.
- PAUL R. VAUGHN, Professor of Agricultural Education and Mechanization, 1990.
B.S., New Mexico State, 1968; M.S., 1974; Ph.D., Ohio State, 1976.
- JAMES ETIENNE VIATOR, Assistant Professor of Law, 1986.
B.A., New Orleans, 1971; J.D., Louisiana State Un. Law Center, 1985.
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B.S., Trinity, 1981; M.Ed., Texas Tech, 1984.
- 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.
- CYNTHIA VONN PREID, Assistant Professor of Music, 1989.
B.M., Texas Tech, 1989.
- YIANNIS VOURTSANIS, Assistant Professor of Mathematics, 1988.
B.S., Athens (Greece), 1980; M.A., California-Berkeley, 1984; Ph.D., 1987.
- 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.
- SUE WADE, Lecturer in Merchandising, Environmental Design, and Consumer Economics, 1983.
B.S., Texas Christian, 1975.
- 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, Associate Professor of Human Development and Family Studies, 1966.
B.S., Texas Tech, 1950; M.S., 1966; Ph.D., Texas (Austin), 1981.
- FRED PHILIP WAGNER, JR., Associate Professor and Chairperson, Department of Technology, 1967.
B.S., Texas Tech, 1950; M.S., 1968; Ph.D., 1971; Reg. Prof. Engr. (Texas).
- DONALD ROY WALKER, Visiting Assistant Professor of History, 1987.
B.A., Texas (Austin), 1969; M.A., Lamar, 1974; Ph.D., Texas Tech, 1983.
- JOHN F. WALKUP, Horn 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, Associate Professor of Chemistry and Biochemistry, 1983.
B.A., Delaware, 1974; Ph.D., Stanford, 1982.
- DERALD DEE WALLING, Professor of Mathematics, 1966.
B.S., Iowa State Coll., 1958; M.S., Iowa State, 1961; Ph.D., 1963.
- RICHARD M. WALTER, Assistant Professor of Accounting, 1989.
B.S., Kentucky, 1978; M.B.A., 1982; Ph.D., Tennessee, 1988.
- ROBERT L. WALZEL, JR., Assistant Professor of Music, 1988.
B.M.E., Houston, 1982; M.M., 1985.
- KAREN SMITH WAMPLER, Professor of Human Development and Family Studies, 1989.
B.A., Indiana, 1964; M.A., Pennsylvania, 1967; Ph.D., Purdue, 1979.

- RICHARD S. WAMPLER, Assistant Professor of Human Development and Family Studies, 1989.
B.A., Indiana, 1964; M.S.W., Georgia, 1981; Ph.D., Pennsylvania, 1970.
- ALEX WANG, Visiting Assistant Professor of Mathematics, 1989.
B.S., Northwest Telecommunication Engineering Inst. (China), 1982; M.S., 1984; Ph.D., Arizona State, 1989.
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B.S., Texas A&M, 1961; M.S., Clemson, 1963; Ph.D., Arizona, 1971.
- SARA WATERS, Associate Professor of Art, 1977.
B.F.A., Spalding, 1974; M.F.A., Indiana, 1977.
- WILLIAM B. WATERS, Instructor in Education, Nutrition, and Restaurant-Hotel Management, 1988.
B.S., Texas Tech, 1957; M.S., 1968.
- JAMES C. WATKINS, Assistant Professor of Architecture, 1983.
B.F.A., Kansas City Art Inst., 1974; M.F.A., Indiana, 1977.
- ANTHONY BIDEN WAY, Associate Professor of Anthropology and Preventive Medicine and Community Health, 1972.
B.A., Williams, 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.
- ROBERT C. WEBER, Assistant Professor of Health, Physical Education, and Recreation, 1989.
B.S., Bemidji State, 1971; M.S., Eastern Illinois, 1973; Ed.D., Utah, 1985.
- DAVID A. WEINBERG, Associate 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.
- MARILYN M. WEINER, Lecturer in Computer Science, 1980.
B.S., Beloit, 1949; M.S., Texas Tech, 1981.
- DAVID A. WELTON, Professor of Education, 1976.
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- CHARLES W. WENDT, Adjunct Professor of Agronomy, Horticulture, and Entomology, 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; Member State Bar (Wisconsin and California).
- CHARLES RICHARD WERTH, Assistant Professor of Biological Sciences, 1987.
B.A., Virginia, 1969; M.Ed., 1973; M.A., 1978; Ph.D., Miami (Ohio), 1983.
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B.S., Colorado State, 1976; M.S., Texas Tech, 1979; Ph.D., 1984.
- PETER WESTFALL, Associate Professor of Business Administration, 1983.
B.S., California (Davis), 1979; M.S., 1981; Ph.D., 1983.
- WILLIAM F. WESTNEY, 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., 1976.
- GARY E. WHITE, Professor of Accounting and Director of Accounting Programs, 1979.
B.S., Colorado, 1963; M.A.S., Illinois, 1964; Ph.D., Washington, 1969; CPA.
- JAMES EDMUND WHITE, Professor of Architecture, 1971.
B.Arch., Texas (Austin), 1957; M.S., Texas Tech, 1973; Reg. Arch. (Texas).
- JOHN POSTON WHITE, Professor of Architecture, 1973.
B.Arch., Texas (Austin), 1957; M.Arch., Nebraska, 1973; Reg. Arch. (Texas and Arizona).
- JOHN THOMAS WHITE, Associate Professor of Mathematics, 1965.
B.A., Texas (Austin), 1952; M.A., 1953; Ph.D., 1962.
- CARLTON J. WHITEHEAD, Professor of Management, 1965.
B.S., Southeastern Louisiana, 1959; M.B.A., Louisiana State, 1962; Ph.D., 1964.
- JAMES S. WHITLARK, Associate Professor of English, 1979.
B.A., Wayne State, 1971; M.A., 1973; Ph.D., Chicago, 1976.
- JULIA CAROL WHITSITT, Assistant Professor of English, 1978.
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- BRUCE RODMAN WHITTLESEY, Assistant Professor of Chemistry and Biochemistry, 1987.
B.A., New Coll. of the U. of South Florida, 1978; Ph.D., Texas (Austin), 1985.
- 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 and Associate Chairperson, Department of Chemistry and Biochemistry, 1963.
B.S., California (Los Angeles), 1956; Ph.D., Washington, 1961.
- ROBERT EDWARD WILKES, Professor of Business Administration and Area Coordinator, Marketing, 1976.
B.S.B.A., Samford, 1963; M.B.A., Alabama, 1969; Ph.D., 1971.
- PEGGY JEAN WILLIAMS, Associate Professor of Health, Physical Education, and Recreation, 1962.
B.S., East Texas State, 1950; M.Ed., 1953.
- MICHAEL R. WILLIG, Associate Professor of Biological Sciences, 1983.
B.S., Pittsburgh, 1974; Ph.D., 1982.
- WELBORN KIEFER WILLINGHAM, Professor of Education and Director, Center for School and Community Counseling, 1961.
B.A., Texas Tech, 1949; M.Ed., Texas (Austin), 1956; Ph.D., Texas Tech, 1964; Lic. Psychol. (Texas).
- MARGARET (PEGGY) EILEEN WILLIS, Professor of Health, Physical Education, and Recreation and Dance, 1972.
B.F.A., Texas Christian, 1970; M.F.A., 1972.
- JANE ANN HENRY WILSON, Associate Professor of Music, 1970.
B.M., Texas Tech, 1962; M.M., Indiana, 1965; D.Mus., 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.
- JANE LOUISE WINER, Professor of Psychology and Associate Dean, College of Arts and Sciences, 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).
- JOHN WITTMAN, Professor of Economics, 1960.
B.S. in B.C., Southern State (Arkansas), 1957; M.B.A., Arkansas, 1959; Ph.D., 1965.
- CAROLE BRUCE WOLF, Lecturer in English, 1980.
B.A., Stephen F. Austin, 1965; M.A., 1968; Ph.D., Texas Tech, 1982.
- D. ROY WOLFE, Assistant Professor of Health, Physical Education, and Recreation, 1988.
B.S., Maryland, 1972; M.S., Kentucky, 1975; Ph.D., Minnesota, 1985.
- 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.
- VAN RICHARD WOOD, Associate Professor of Marketing, 1982.
B.A., Washington, 1973; M.B.A., 1975; Ph.D., Oregon, 1982.
- WARREN K. WRAY, Professor and Chairperson, Department 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.
- WALTER E. WRIGHT, Major, U.S.A.R., Assistant Professor of Military Science, 1989.
B.A., Virginia Military Inst.; M.P.S., Western Kentucky.
- SURYA B. YADAV, Associate Professor of Information Systems, 1981.
B.Sc.E.E., Banaras Hindu U. (India), 1972; M.Tech., Indian Inst. of Technology Kanpur (India), 1974; M.B.I.S., Georgia State, 1978; Ph.D., 1981.
- SONG YANG, Assistant Professor of Mathematics, 1988.
B.S., Sichuan, 1982; Ph.D., Michigan State, 1988.
- CHARLOTTE HEGI YOUNG, Lecturer in Computer Science, 1985.
B.S.Ed., Abilene Christian, 1976; M.C.S., Texas A&M, 1981.
- MARIA ZACK, Assistant Professor of Mathematics, 1989.
B.S., California (San Diego), 1984; Ph.D., 1989.

JOHN CHARLES ZAK, Assistant Professor of Biological Sciences, 1986.

B.S., Pittsburgh, 1974; M.S., 1976; Ph.D., Calgary, 1981.

RICHARD E ZARTMAN, Associate Professor of Soil Physics, 1974.

B.S., Ohio State, 1968; Ph.D., Kentucky, 1974.

KLAUS W. ZIEHER, Associate Professor of Electrical Engineering, 1986.

Dipl. Phys. Physics, Eberh-Karls U., 1966; M.Sc., Washington (Seattle), 1969; Dr.rer.nat., U. Karlsruhe, 1974.

*Deceased December 25, 1989.

"On leave spring 1990.

†On leave 1989-1990.

††Deceased July 28, 1989.

#Deceased April 3, 1990

##Deceased December 3, 1989.

§On leave 1990-1991.

Emeritus Faculty and Administrative Officers

(Dates indicate years at Texas Tech)

- BURL MONROE ABEL, Associate Professor of Business Administration, Emeritus, 1955-1973.
 JOE ALFRED ADAMCIK, Associate Professor of Chemistry, Emeritus, 1957-1988.
 BEATRICE WITTE ALEXANDER, Associate Professor of Romance Languages, Emeritus, 1945-1984.
 THEODOR WALTER ALEXANDER, Professor of German and Slavic Languages, Emeritus, 1947-1984.
 ARCHIE CORNELIOUS ALLEN, Associate Professor of Biological Sciences, Emeritus, 1963-1986.
 JAMES GEORGE ALLEN, Dean of Student Life and Professor of English, Emeritus, 1927-1972.
 LOUISE CRAWFORD ALLEN, Associate Professor of Journalism, Emeritus, 1928-1963.
 ALI REZA AMIR-MOEZ, Professor of Mathematics, Emeritus, 1965-1988.
 ROBERT HENRY ANDERSON, Professor and Dean of Education, Emeritus, 1973-1983.
 ROBERT PAUL ANDERSON, Professor of Psychology, Emeritus, 1955-1986.
 CLIFFORD CHARLES ASHBY, Professor of Theatre Arts, Emeritus, 1963-1989.
 DONALD ASHDOWN, Professor of Entomology, Emeritus, 1952-1984.
 FRANK LORENZO BAIRD, Associate Professor of Political Science, Emeritus, 1968-1981.
 GEORGE LEWIS BALDWIN, Associate Professor of Mathematics, Emeritus, 1966-1988.
 GLENN E. BARNETT, Professor of Education and Vice President, Emeritus, 1968-1981.
 NOLAN ELLMORE BARRICK, Kleinschmidt Professor of Architecture, Emeritus, 1953-1979.
 JEAN CAMILLE GRAVES BELL, Professor of Home Economics Education, Emeritus, 1963-1985.
 JAMES WAYLAND BENNETT, Thompson Professor of Agricultural Finance, Emeritus, 1948-1989.
 LOTUS BERRY BLACKWELL, Associate Professor of Business Administration, Emeritus, 1948-1981.
 MARY MIDDLETON BOSWELL, Associate Professor of Home Economics Education, Emeritus, 1968-1985.
 NEVILLE HASSO BREMER, Professor of Education, Emeritus, 1965-1978.
 MARY LOUISE BREWER, Associate Professor of English, Emeritus, 1941-1973.
 PEGGY HOWARD BRIGHT, Associate Professor of Art, Emeritus, 1966-1986.
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 WILLIAM GASTON CAIN, JR., Professor of Business Administration, Emeritus, 1955-1979.
 EARL D. CAMP, Professor of Biological Sciences, Emeritus, 1945-1985.
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 CARL JOHN CHILDERS, JR., Professor of Architecture, Emeritus, 1959-1985.
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JOE DENNIS, Professor of Chemistry, Emeritus, 1938-1976.
JOHN DIXON DOWNES, Professor of Horticulture, Emeritus, 1970-1984.
ARTHUR LINCOLN DRAPER, Associate Professor of Chemistry, Emeritus, 1959-1985.
HAROLD ERNEST DREGNE, Horn Professor of Plant and Soil Science, Emeritus, 1969-1985.
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RALPH MARION DURHAM, Professor of Animal Science, Emeritus, 1959-1980.
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RAYMOND PRUITT ELLIOTT, Professor of Music, Emeritus, 1950-1969.
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WALTER GRUB, Professor of Agricultural Engineering, Emeritus, 1966-1985.
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ARNOLD JARVIS GULLY, Professor of Chemical Engineering and Engineering Technology, Emeritus, 1963-1982.
THOMAS EARLE HAMILTON, Professor of Classical and Romance Languages, Emeritus, 1940-1971.
RAE LAWRENCE HARRIS, JR., Professor of Geography, Emeritus, 1957-1989.
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.
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LYNWOOD M. HOLLAND, Professor of Political Science, Emeritus, 1967-1971.
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FRANK ALDEN HUDSON, Professor of Animal Science, Emeritus, 1960-1988.
WILLIAM KEITH IKES, Professor of Speech and Hearing Sciences, Emeritus, 1962-1986.
RAY CURTIS JANEWAY, Director of Library Services, Emeritus, 1949-1982.
WILLIAM LOYD JENKINS, Associate Professor of Industrial Engineering and Engineering Technology, Emeritus, 1946-1985.

- PHILIP JOHNSON, Professor of Petroleum Engineering, Emeritus, 1947-1976.
 LEWIS NORTON JONES, Dean of Students, Emeritus, 1938-1978.
 U. V. JONES, Professor of Law, Emeritus, 1966-1980.
 CLIFF HUTCHINSON KEHO, Associate Professor of Civil Engineering, Emeritus, 1957-1988.
 CLYDE E. KELSEY, JR., Professor of Education, Emeritus, 1972-1987.
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 EARL EUGENE KENNEY, Professor of Music, Emeritus, 1957-1982.
 RICHARD ORVILLE KESLIN, Associate Professor of Anthropology, Emeritus, 1964-1987.
 MARLIN DEAN KILLION, Director of Bands, Emeritus, 1959-1985.
 LILA ALLRED KINCHEN, Associate Professor of Clothing and Textiles, Emeritus, 1939-1967.
 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.
 MINA MARIE WOLF LAMB, Margaret W. Weeks Professor of Food and Nutrition, Emeritus, 1940-1975.
 MURL ALTON LARKIN, Maddox Professor of Law, Emeritus, 1968-1989.
 THOMAS LUTHER LEACH, Professor of Agricultural Education, Emeritus, 1937-1978.
 IVAN LEE LITTLE, Professor of Philosophy, Emeritus, 1946-1979.
 THOMAS BROOKS LIVINGSTON, Professor of Education, Emeritus, 1949-1972.
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 MARTHA MORROW LOGAN, Associate Professor of Family Management, Housing, and Consumer Science, Emeritus, 1969-1985.
 DONALD SHERMAN LONGWORTH, Professor of Home and Family Life, Emeritus, 1966-1982.
 THOMAS GREEN MANNING, Professor of History, Emeritus, 1956-1979.
 HUGO DIXON MARPLE, Professor of Music, Emeritus, 1969-1985.
 ROBERT EDWARD MARTIN, Associate Professor of Mechanical Engineering, Emeritus, 1949-1985.
 RICHARD BENJAMIN MATTOX, Professor of Geosciences, Emeritus, 1954-1982.
 BRUCE DOUGLAS MATTSON, Professor of Education, Emeritus, 1965-1983.
 HENRY JAMES MAXWELL, Professor of Spanish, Emeritus, 1963-1989.
 WILLIAM JAMES MAYER-OAKES, Professor of Anthropology, Emeritus, 1971-1989.
 DARRELL KEITH McCARTY, Professor of Music, Emeritus, 1953-1988.
 JOSEPH THOMAS McCULLEN, JR., Professor of English, Emeritus, 1949-1980.
 GORDON CARTWRIGHT McCUTCHAN, Professor of Architecture, Emeritus, 1962-1984.
 DONALD McDONALD, Professor of Education and Library Science, Emeritus, 1948-1982.
 VERNON RAY McGUIRE, Associate Professor of Speech Communication, Emeritus, 1965-1986.
 JAMES FABER McNALLY, Associate Professor of Health, Physical Education, and Recreation, Emeritus, 1952-1989.
 CLARA MUELLER McPHERSON, Associate Professor of Education, Nutrition, and Restaurant-Hotel Management, Emeritus, 1947-1986.
 CLINTON MARSUD McPHERSON, Associate Professor of Chemistry, Emeritus, 1956-1984.
 GEORGE PEYTON MECHAM, Professor of Education, Emeritus, 1951-1970.
 BETTY JO MILLS, Curator of The Museum, Emeritus, 1959-1986.
 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.
 GROVER ELMER MURRAY, University Professor of Geosciences and President, Emeritus, 1966-1988.
 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.
 WILLIAM EUGENE ODEN, Professor of Political Science, Emeritus, 1948-1984.
 ROBERT MARSHALL PARKER, Associate Professor of Mathematics, Emeritus, 1946-1973.
 RODERICK PARKINSON, Associate Professor of Art, Emeritus, 1946-1975.
 BILL J. PARSLEY, Vice President for Public Affairs, Emeritus, 1966-1983.
 WILLIAM ROBERT PASEWARK, Professor of Education, Emeritus, 1956-1982.

- MILTON LESTER PEEPLES, Professor of Food Technology and Animal Science, Emeritus, 1951-1980.
- CONNER COLUMBUS PERRYMAN, Professor of Engineering Drawing, Emeritus, 1929-1965.
- RUSSELL DEAN PETTIT, Associate Professor of Range Management, Emeritus, 1969-1989.
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- FLORENCE LOUISE PHILLIPS, Professor of Psychology, Emeritus, 1954-1985.
- FANNIE ERNESTINE PILLOW, Associate Professor of Education, Emeritus, 1965-1976.
- CHARLES WILLIAM POST, Professor of Music, Emeritus, 1957-1984.
- 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.
- ROBERT GEORGE REKERS, Associate Professor of Chemistry and Biochemistry, Emeritus, 1955-1986.
- FRED DURNFORD RIGBY, Professor of Mathematics, Emeritus, 1940-1980.
- CHARLES LATHAN RIGGS, Professor of Mathematics, Emeritus, 1953-1987.
- DELILAH MANIRE ROCH, Associate Professor of Clothing and Textiles, Emeritus, 1967-1982.
- JOHN ROBERT ROGERS, Professor of Education, Emeritus, 1970-1980.
- RUTH MARIE ROGERS, Professor of Health, Physical Education, Recreation, and Dance, Emeritus, 1971-1989.
- BILLY IRVAN ROSS, Professor of Mass Communications, Emeritus, 1970-1988.
- ROBERT LYLE ROUSE, Professor of Economics and Business Administration, Emeritus, 1950-1985.
- REGINALD RUSHING, Professor of Accounting, Emeritus, 1939-1971.
- ALBERT JOSEPH SANGER, Professor of Engineering Technology, Emeritus, 1956-1984.
- THEODORE WILLIAM SCHETTLER, Associate Professor of Music, Emeritus, 1968-1983.
- GERALD LYNN SHURBET, Associate Professor of Mathematics, Emeritus, 1956-1987.
- RUSSELL HOLLAND SEACAT, JR., Professor of Electrical Engineering, Emeritus, 1959-1984.
- 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.
- VERA LOIE JARRARD SIMPSON, Associate Professor of Speech Communication, Emeritus, 1964-1985.
- ROLAND EDGAR SMITH, Professor of Political Science, Emeritus, 1968-1986.
- TOM BASIL STENIS, Associate Professor of Electrical Engineering, Emeritus, 1947-1987.
- FRANCIS B. STEPHEN, Professor of Art, Emeritus, 1967-1983.
- WILLIAM ADDISON STEWART, Professor of Architecture, Emeritus, 1965-1984.
- RUSSELL WILLIAM STRANDTMANN, Horn Professor of Biological Sciences, Emeritus, 1948-1975.
- ALFRED BELL STREHLI, Professor of Spanish, Emeritus, 1928-1969.
- MARGRET RUSSELL STUART, Associate Professor of Chemistry, Emeritus, 1946-1979.
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- HAZEL SCOTT TAYLOR, Associate Professor of Education, Emeritus, 1973-1985.
- FRANK MILLETT TEMPLE, Associate Director of Library Services, Emeritus, 1951-1979.
- DAHLIA JEWEL TERRELL, Professor of English, Emeritus, 1956-1985.
- HENRY COFFMAN THOMAS, Professor of Physics, Emeritus, 1958-1984.
- VIRGINIA LEE TOMPKINS, Associate Professor of Home Economics Education, Emeritus, 1966-1983.
- LELAND FLOYD TRIBBLE, Professor of Animal Science, Emeritus, 1967-1989.
- SCOTT 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.
- WILLIE LEE ULICH, Professor of Agricultural Engineering and Technology, Emeritus, 1961-1984.
- HARRY STUART WALKER, Associate Professor of Economics, Emeritus, 1953-1986.

WARREN STANLEY WALKER, Horn Professor of English, Emeritus, 1964-1986.

DOROTHY ESTELLE HAYS WALLACE, Professor of Home and Family Life, Emeritus, 1959-1975.

MORRIS SHEPPARD WALLACE, Horn Professor of Education, Emeritus, 1955-1974.

TERREL BARNEY WARREN, Professor of Architecture, Emeritus, 1964-1976.

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.

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WILLIE MAE WOLFE, Associate Professor of Home Management, Emeritus, 1955-1976.

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RUTH COWART WRIGHT, Associate Professor of Political Science, Emeritus, 1957-1983.

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EDWARD WILLIAM ZUKAUCKAS, JR., Associate Professor of Horticulture, Emeritus, 1952-1984.

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American Association of Colleges for Teacher Education
American Association of Landscape Architects
American Association of Marriage and Family Therapy
American Association of Museums
American Association of Petroleum Land Management
American Bar Association
American Chemical Society
American Dietetic Association
American Home Economics Association
American Psychological Association
American Society of Mammalogists
American Society of Microbiology
American Speech, Language, and Hearing Association
Council on Rehabilitation Education
Council on Social Work Education
Foundation for Interior Design Education and Research
International Association for the Education of Young Children
National Architectural Accrediting Board
National Association for the Education of Young Children
National Association for Schools of Art and Design
National Association of Schools of Music
National Association of Schools of Public Affairs and Administration
National Association of Schools of Theatre
National Council for the Accreditation of Teacher Education
National Parks and Recreation Association
Society for Range Management
Southern Association of Colleges and Schools
Texas Education Agency