

**BULLETIN
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TEXAS TECHNOLOGICAL COLLEGE**

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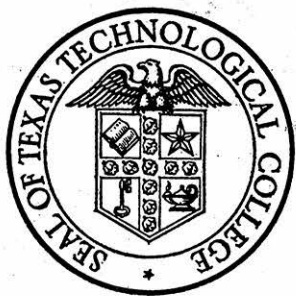
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General Catalog

With Announcements for 1968-1969



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College Calendar, 1968-1969

Forty-fourth Annual Session

Fall Semester 1968

- Sept. 15 Sunday. Fall semester begins.
10 a.m., residence halls open for occupancy. First meal breakfast, Monday, Sept. 16.
- Sept. 16-21 Monday-Saturday. Registration for the fall semester.
- Sept. 23 Monday. Classes begin.
- Sept. 25 Wednesday. 4:30 p.m., general faculty and staff meeting.
- Oct. 7-9 Monday-Wednesday. Period for 1969 degree candidates to file information forms and photographs with the Placement Service.
- Oct. 21 Monday. Grade of W will be given for courses dropped on or before this date.
- Oct. 26 Saturday. Homecoming.
- Nov. 11 Monday. 9 a.m., midsemester grade reports due in the office of the Registrar.
- Nov. 27 Wednesday. 12 noon, classes dismissed for Thanksgiving holidays.
- Dec. 2 Monday. 8 a.m., classes resumed.
- Dec. 21 Saturday. 12 noon, classes dismissed for Christmas holidays. Residence halls will close at 2 p.m.

1969

- Jan. 5 Sunday. 10 a.m., residence halls open. First meal, breakfast, Monday, Jan. 6.
- Jan. 6 Monday. 8 a.m., classes resumed.
- Jan. 7 Tuesday. Last day to drop a course.
- Jan. 12-16 Sunday-Thursday. Period of restricted social activities.
- Jan. 16 Thursday. Day of no classes.
- Jan. 17-24 Friday-Friday. Final examinations for the fall semester.
- Jan. 25 Saturday. Students without reservations for the spring semester must vacate residence halls by 10 a.m. Fall semester ends.
- Jan. 27 Monday. 9 a.m., grades and absence reports for fall semester due in the office of the Registrar.

Spring Semester

- Jan. 26 Sunday. 10 a.m., residence halls open to new occupants.
- Jan. 27 Monday. Spring semester begins.
- Jan. 27-Feb. 1 Monday-Saturday. Registration for the spring semester.
- Feb. 3 Monday. Classes begin.
4:30 p.m., general faculty meeting.
- March 3 Monday. The grade of W will be given for all courses dropped on or before this date.
- March 18 Tuesday. Last day for May degree candidates to file information forms and photographs with the Placement Service.

- March 23 Sunday. All-College Recognition Service.
- March 25 Tuesday. Last day for May degree candidates to order academic regalia and invitations at the Bookstore. Last day for degree candidates who expect to receive diplomas at the May Commencement to pay graduation fee at the Comptroller's office.
- March 31 Monday. 9 a.m., midsemester grade reports due in the office of the Registrar.
- April 2 Wednesday. 10 p.m., classes dismissed for Spring Vacation.
- April 9 Wednesday. 8 a.m., classes resumed.
- April 22 Tuesday. Last day for May degree candidates to complete correspondence courses. (Instructors will file grades on correspondence courses by Thursday, May 1.)
Last day to submit to an academic dean a request to graduate **in absentia**.
Last day for May degree candidates to remove grades of I and P. Instructors will send change-of-grade cards to the student's academic dean as soon as work has been completed.
- May 5 Monday. Last day to drop a course.
- May 13-19 Tuesday-Monday. Period of restricted social activities.
- May 16 Friday. Last day to submit to the Graduate Dean the final copy of thesis or dissertation.
- May 19 Monday. Day of no classes.
- May 20-27 Tuesday-Tuesday. Final examinations for the spring semester.
- May 27 Tuesday. Residence halls dining rooms close with serving of the evening meal.
- May 28 Wednesday. 10 a.m., residence halls close. Degree candidates may occupy rooms until 10 a.m., Sunday, June 1.
12 noon, grades and absence reports for degree candidates due in the office of the Registrar.
- May 30 Friday. 3 p.m., final and official graduation lists due in the office of the Registrar.
- May 31 Saturday. 8:30 a.m., graduation rehearsal for all degree candidates.
Academic regalia must be obtained at the College Bookstore prior to 12 noon.
8 p.m., Commencement exercises.
Spring semester ends.
- June 2 Monday. 9 a.m., all grades and absence reports for the spring semester due in the office of the Registrar.

Summer Session 1969

- June 3 Tuesday. Summer session begins.
- Aug. 23 Saturday. Summer session ends.

Fall Semester 1969

- Sept. 12 Friday. Fall semester begins.

General Information

Texas Technological College

Texas Technological College has been designated as one of the state-supported multidisciplinary universities in Texas. The institution's purposes are to meet the increasing demands for continuing education for all citizens and to provide educational opportunities for the youth of the state at undergraduate, professional, and graduate levels. Furthermore, it strives to create an atmosphere conducive to scholarly and scientific research, with a special emphasis on arid and semi-arid lands.

History. Created by legislative action on February 10, 1923, Texas Technological College was located in Lubbock, a city with a current population estimated at 170,000. It is situated on the fertile South Plains at an elevation of 3,250 feet above sea level and has a dry, invigorating climate.

The College opened in the fall of 1925 with six buildings and an enrollment of 910 drawn from 220 Texas towns and five other states. In the fall of 1967 the enrollment was 18,646 and is expected to reach 35,000 by 1975.

The original subdivisions for instruction (then called "Colleges") were Liberal Arts, Household Economics, Agriculture, and Engineering. These later became "divisions," and in 1956 the present designation of "schools" was adopted, with Liberal Arts becoming Arts and Sciences and Household Economics, Home Economics. Graduate instruction was begun in the fall of 1927 within the "College" of Liberal Arts, and in 1935 the Graduate School was established. The School of Business Administration was created (as the "Division" of Commerce) in 1942. Both the School of Law, provided for in 1965, and the School of Education, organized in 1966, began instruction in 1967.

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.

Texas Technological College 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 the biological and physical sciences. Although retaining the words "Technological" and "College" in its name, the institution has become a true university.

Presidents of Texas Tech have been Paul Whitfield Horn (1925-1932), Bradford Knapp (1932-1938), Clifford B. Jones (1938-1944) and President Emeritus since 1944), William Marvin Whyburn (1944-1948), Dossie M. Wiggins (1948-1952), Edward Newlon Jones (1952-1959), and Robert Cabaniss Goodwin (1960-1966, Acting President, 1959-1960). Grover E. Murray became President on September 1, 1966, and was formally inaugurated on November 1.

Physical Plant. With 1,839 acres in one contiguous tract, the Texas Technological College campus is one of the largest in America. In addition, the College operates the Texas Technological College Research Farm near Amarillo, consisting of 5,821 acres of deeded land, and holds an agricultural use permit on another 8,000 acres.

In physical appearance the campus buildings are predominantly in the architectural style of the Spanish Southwest. The newer buildings, such as the strikingly modern Library, have been designed to harmonize with the original Spanish Renaissance motif. There are 208 buildings on the campus, 107 of

which are considered permanent. The plant value has been set at \$78 million with an anticipated additional \$40 million in construction to be added by 1970.

The Texas Tech campus is also noted for its landscaping which presents colorful, well-kept flower beds and tree-dotted lawns to complement its architecture.

Financial Support. The College receives the major share of its educational and general operating funds from appropriations by the legislature out of general revenue funds of the state. Income from tuition, fees, and services also forms an important part of college revenue. For the construction of academic and general buildings, funds are made available from a constitutional building amendment fund. The residence halls, intercollegiate athletics, bookstore, student publications, student health center, student union, and college press are all self-supporting enterprises.

The Texas Technological College Foundation is a nonprofit corporation which serves as the gift-receiving agency of the College. 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 of the College. Texas Technological College is governed by a Board of Directors whose nine members are appointed by the Governor of the State of Texas to hold office for six-year periods; the terms of office of three Directors expire every two years. The Board is legally responsible for the establishment and control of the College's policies; it appoints the President who directs the operations of the institution. Based on the President's recommendations, the Board of Directors appoints all faculty and other employees and fixes their salaries.

The President is responsible for carrying out policies determined by the Directors and for supervising the College's activities.

Upon recommendation of the faculty and under authority vested in him by the Board of Directors, the President also confers all degrees granted by the College. The President is assisted by an Executive Vice President, a Vice President for Academic Affairs who oversees the educational programs of the institution, a Vice President for Business Affairs who is the fiscal manager of the College, a Vice President for Development who has charge of the program of gifts and bequests, and a Vice President for Research who is responsible for coordinating the research activities of the institution.

The Dean of Admissions is responsible for the acceptance of students under the institution's admission policies, for maintaining students' records, and for directing the registration process.

The Dean of Student Life, the Dean of Men, and the Dean of Women are concerned with the general welfare of the student and are responsible for a variety of programs which the College considers appropriate to the educational development of the individual.

In the traditional pattern of a true university, Texas Technological College consists of eight separate schools: the School of Agriculture, the School of Arts and Sciences, the School of Business Administration, the School of Education, the School of Engineering, the School of Home Economics, the School of Law, and the Graduate School. All undergraduate degree programs are conducted by the six undergraduate schools; all graduate degree programs, by the Graduate School; and the law degree program, by the School of Law. Each school is administered by a dean and his staff, and each (except the Graduate School and Law School) consists of a number of instructional departments which offer the courses taught at Texas Technological College. In addition there are a number of specialized divisions and departments, such as the Extension Division, the departments of Military Science and Aerospace Studies, the Library, and the Museum.

Ex-Students Association. The Ex-Students Association is an independent organization cooperating with and serving the College and providing an opportunity for continued friendship and a close relationship among ex-students. Every former student of the College is eligible for membership on application to the association. Besides serving as an alumni organization, the association performs a number of services for the College. It maintains records of alumni, recruits outstanding academic students, provides scholarships and loan funds, and publishes news of College and alumni activities through the *Texas Techsan* and *Tex Talks*.

ICASALS. The Board of Directors has adopted as the unique mission of this institution the study of those arid and semi-arid lands which comprise approximately half of the exposed surface of the earth. The International Center for Arid and Semi-Arid Land Studies (ICASALS) was officially established in August 1966 as an integral part of Texas Technological College, with its foundation in the entire undergraduate and graduate academic structure of the university.

ICASALS is the medium of coordination and implementation of research activities of faculty and staff pertaining to arid and semi-arid lands. Its ultimate goal is the development of a world-wide center of multidisciplinary knowledge of these lands. To this end plans are now being effected for a new ICASALS Institute and Museum which will be devoted to continuing education and dynamic displays and exhibits. A library and documentation center is also envisioned which will make available holdings of all types of recorded knowledge, including books, periodicals, manuscripts, photographs, films, tapes, and computerized information.

It is expected that in the future Texas Technological College will be known not only as a university of the first class but also as the home of an international endeavor designed to enrich the lives and increase the knowledge of all peoples.

Campus Facilities

College Bookstore. The College Bookstore enables students to purchase textbooks, books for extension courses, supplies, and other equipment for classroom and laboratory work. It also provides such services as special ordering, wrapping packages for mail, repair service, and repurchase of usable textbooks. Conveniently located near the Administration Building, the College Bookstore is a modern self-service enterprise. It is self-supporting and is owned and operated by the College. All profits from its operation are returned to student welfare and recreation uses.

Computer Center. The Computer Center serves the entire academic community, providing computer time on both digital and analog computers. Current facilities include an IBM 7040/1401 system, an IBM 1620, a CDC G-15, an EAI TR-48, and an IBM 1231 Optical Scanner. Computer time is made available to the academic community for educational purposes and unsponsored research without charge, upon acceptance of a valid usage request. The center provides operators for its digital equipment and programming consultants to assist users in problem definition, programming, and the use of programming packages.

The center maintains an extensive library of generalized routines for use in statistical analysis, mathematics, operations research, etc. The use of FORTRAN IV is encouraged, but the center will process any standard programming language such as SIMSCRIPT, COBOL, MAP, and ALGOL.

Many academic departments offer computer programming as primary subject matter or as ancillary to the prime subject. A 2-hour course in computer programming is offered each semester and in both summer terms. In addition, the Computer Center offers frequent noncredit, cost-free seminars in FORTRAN IV and the use of generalized routines.

Food Services. The Student Union has three separate dining areas in the building to serve the students, faculty, and guests on the campus. The informal snack bar, serving breakfasts, hot and cold drinks, sandwiches, and a la carte orders, is open approximately 14 hours a day during the week and from 2 p.m. to 10:30 p.m. on Sundays. The cafeteria provides a variety of foods at reasonable prices during the lunch period, and assorted drinks and snacks are also available in this area from 8 a.m. to 2 p.m., five days a week. The faculty club serves coffee and rolls during the day and a cafeteria-style lunch five days a week to club members and their guests. The Union also provides a catering service for campus organizations and groups and is prepared to serve from 5 to 500 in one or more of the special dining areas in the building. Arrangements can be made at the Union office for buffets, banquets, luncheons, teas, coffees, and picnic orders.

All students who live in the residence halls on the campus are provided meals by Residence Halls Food Service in food service areas. Three meals per day are served except on Sundays when no evening meal is served.

In order to minimize the cost to the student, Texas Tech Residence Halls Food Service maintains a Central Food Facility for warehousing of canned

food, staple groceries, and frozen food; for preliminary processing of produce; and for preparation of baked goods. The facility also houses the offices of Residence Halls Food Service and an experimental kitchen for recipe standardization and testing of foods for purchase.

There are food and soft drink concession machines in most buildings on the campus which are owned and serviced by contract vendors under the direction of the Business Manager.

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

Precedent-setting methods were used in this expansion. First, the entire east stands—more than 10 million pounds of concrete and steel—were moved 226 feet eastward. Then the area between the east and west stands was excavated to a depth of 30 feet—259,000 cubic yards of earth being removed. At the bottom of the man-made bowl, a new gridiron was laid out and new turf planted. Along the slopes created by the excavation new seats were constructed, bringing the stadium to its present capacity. About 15,000 more seats can be placed on the north slope, which is often utilized by overflow crowds.

Although other stadiums are larger, few have more seating between the goal lines, since only 4,500 seats are in the south end zone, and few are as well lighted for night games.

KTXT-FM. KTXT-FM is the College-owned radio station with studios in the Speech Building. Operating on a frequency of 91.9 mc with a power of 10 watts, the station provides a service of music, news, and special programs complementary to that provided by local commercial stations and provides a channel of communication within the Texas Tech community and from the College to the Lubbock community. KTXT-FM is administered by the Speech Department and is managed and staffed by Texas Tech students. Station facilities are also used by broadcasting students enrolled in some courses in the Speech Department.

KTXT Television. Station KTXT-TV is an open-channel, noncommercial educational television station owned and operated by Texas Technological College and broadcasting on the frequency of channel 5. The studio, transmitter, and 450-foot tower of KTXT-TV are located on the College campus. Broadcasts can be received over a 50-55 mile radius on conventional residential sets.

The station is equipped with the most modern and finest monochrome facilities available. The station is staffed and operated by professional personnel.

Courses for residence credit at the College are broadcast during each of the long semesters. Information on the televised courses is available through the Educational Television office.

Educational television is one of the teaching implements used by the College to serve the increasingly large enrollments and to enrich the instructional program. KTXT-TV, through the broadcast of programs on public affairs, science, and fine arts, assists the College in serving the cultural interests of the community.

The television station also provides laboratory facilities for students enrolled in courses related to television station management, operation, and studio production.

Library. The collections of the College Library are intended to meet the research needs of faculty and students in support of the academic program and are housed in an air-conditioned building completed in 1962. Holdings now total nearly 1,000,000 items, including books, periodicals, government documents, and other materials. An open-shelf arrangement makes the holdings readily available to students and faculty alike. To improve its services the Library maintains readers for microfilm and microprint, provides a rapid copy service, and has individual study rooms for faculty members engaged in research. Also, individual study tables are conveniently distributed throughout the stacks. There is space in the stacks and the reserve and reference rooms for a total of 1,009 readers. The Library is designated as one of the two Regional Depositories for U. S. Government Documents in Texas and as a depository of the Atomic Energy Commission. Holdings of standard classics were recently enriched by the purchase of the entire 26,000 volume

stock of a bookstore in New York City, partially financed by the Friends of the Library of Texas Technological College. Although the Library serves principally the faculty and students of the College, it is often able to supplement the services of other libraries in the area.

The Library is staffed by 28 professional librarians and 35 subprofessionals who provide service during the following hours: 7:20 a.m. to 12 midnight, Monday through Friday; 7:20 a.m. to 5 p.m., Saturday; 2 p.m. to 12 midnight, Sunday. Closed holidays. Summer terms: 7:20 a.m. to 10 p.m., Monday through Friday; 7:20 a.m. to 5 p.m., Saturday. Closed Sundays and holidays.

Municipal Auditorium-Coliseum. The Municipal Auditorium-Coliseum is located on the north edge of the campus near Jones Stadium. The Auditorium will seat approximately 3,200 persons and the Coliseum approximately 10,000 persons. Although they are operated by the City of Lubbock, both are used frequently on a rental basis by the College for large classes and for such occasions as convocations, graduation exercises, cultural events, basketball games, rodeos, and other special events.

Museum. The Texas Technological College Museum is chiefly financed by legislative appropriations handled through the College. Sponsorship and additional financial aid comes from the West Texas Museum Association. Membership in this association is open to all persons interested in the Museum's objectives. The association publishes the *Museum Journal* annually for distribution to all members. Museum exhibits include three permanent galleries treating history, ethnology, archaeology, and geology, and one gallery, plus wall space, for rotating and temporary exhibits. A Spitz planetarium, located in a building behind the Museum, is used in demonstrations for school children on weekdays and for the public at regular intervals. The Museum is open to students, faculty, school classes, and all interested visitors to Lubbock. A new air-conditioned museum building has been approved for construction on 76 acres of the campus at 4th Street and Indiana. A special gallery will serve as a "showcase" for ICASALS. It is planned to move to these larger quarters in the near future, making the present building in the heart of the campus available for classrooms and faculty offices.

Placement Service. The Placement Service is a central agency which brings together employers, faculty, and students. Its services are available to all students of the College regardless of major field of study or professional interest. Alumni and ex-students also may use the services. Students who need part-time employment may seek assistance from the Placement Service where positions with Lubbock business firms or with the College are listed.

Preschool Laboratories. The Department of Home and Family Life in the School of Home Economics maintains four Preschool Laboratories as observation centers for the program in child development and family relations. The children are divided into different age groups ranging from two and one-half through five years of age. These laboratories provide varied opportunities for the college student to study young children at different ages and, at the same time, assist them in the understanding of their own development and behavior. The laboratories meet the professional and physical standards of the National Association for the Education of Young Children. Reservations for enrolling children in the Preschool Laboratories should be made through the Department of Home and Family Life.

Research Farms. In addition to the 1,500-acre farm laboratory adjoining the main campus, the School of Agriculture operates the Texas Technological College Research Farm at Pantex, Texas, northeast of Amarillo. This farm consists of approximately 5,821 acres of deeded land and an agricultural use permit on an additional 8,000 acres of the Army Ordnance Plant.

This farm serves as a valuable facility for agricultural research and education, adding strength, flexibility, and prestige to the academic programs at Texas Technological College. Opportunities are provided at the Research Farm for studies in livestock, crops, soils, and water use.

A new center for scientific research in beef cattle improvement has been constructed at the Research Farm with a \$500,000 grant from the estate of Florence Lee and C. L. Killgore. Known as the Killgore Beef Cattle Center, this facility serves as the headquarters for all studies in the Panhandle area originating from the Research Farm.

Field days are held annually and special tours of the Research Farm are arranged at the request of interested individuals and groups.

Residence Halls. The residence halls system consists of 22 halls, 11 dining rooms, 10 kitchens, a central food processing and storage facility, and administrative offices. The residence halls house 3,575 single men and 5,312 single women students.

In the fall of 1968, Texas Tech's residence halls for women will be Doak, Drane, Horn, West, Knapp, Weeks, Wall, Gates, Hulen, Clement, Stangel, Chitwood, and Coleman halls. Men students will be housed in Sneed, Gordon, Bledsoe, Gaston, Thompson, Wells, Carpenter, Murdough, and Weymouth halls.

The following services and facilities are provided in all residence halls: direct telephone lines to each room, mail service to each hall (except the Wiggins Complex which has a central mail distribution center), storage rooms for trunks and luggage, color TV lounges, elevators, quiet study areas, and public lounges. Most halls have laundry rooms with automatic washers and dryers, and laundry and dry cleaning service is available in the men's residence halls. In addition, each hall has its own special features, and the newer halls are fully air-conditioned.

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

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.

Southwest Collection. The Southwest Collection is both the College archives and a major repository for historical materials pertaining to the American Southwest.

Its quarters in the Social Science Building provide excellent facilities for study and research, as well as space for storage of noncurrent business records, personal papers, biographical data, maps, microfilms, tape recordings, periodicals, photographs, newspapers, and a special library of Southwestern books.

Manuscript holdings alone total three million leaves, and data pertaining to cataloged collections are published by the Library of Congress in the *National Union Catalog of Manuscript Collections*.

All materials may be used by both students and the general public for research or reference, but due to the fact that preservation is inherent in the operation of such a repository, items cannot be removed from the quarters.

Service is provided during the following hours: 8 a.m. to 12 noon and 1 p.m. to 5 p.m., Monday through Friday; 8 a.m. to 12 noon, Saturday. Inquiries are welcomed.

Speech and Hearing Clinic. The Speech and Hearing Clinic, located in the University Theater Building, is designed primarily to provide clinical practicums for student speech pathologists and audiologists. Clinical cases of all ages are accepted upon referral from physicians, social agencies, and public or private schools.

In addition the clinic aids Texas Tech students who have speech and/or hearing disorders. Some possibilities for therapy include articulation disorders, voice disorders, and speech disorders resulting from cerebral palsy, cleft palate, or brain injury. The clinic can assist in the selection of a hearing aid and provide the training necessary for its proper use.

Student Health Center. The Student Health Center, staffed by licensed medical doctors and other professional personnel, consists of an in-patient department (hospital) and an out-patient department (clinic). The services of the College physicians and nurses are restricted to the hospital and clinic; dormitory and house calls are not made.

The 32-bed hospital accommodates students who become ill enough to require constant supervision as in-patients. Students are admitted to the hospital by a College physician and are under the care of a physician and registered nurse 24 hours a day. Students are entitled to the maximum of seven days per semester without charge, except for the cost of special medications, examinations, treatments, x-ray examinations, and special laboratory tests. For each day beyond the seven-day period, patients are charged a modest fee to cover the cost of food, drugs, supplies, and special services.

For students not requiring hospitalization, the clinic is open 8 a.m. to 4:30 p.m., Monday through Friday, and 8 a.m. to 12 noon, Saturday. Students may receive emergency treatment at other times by reporting to the nurse on duty in the hospital.

The Student Health Center cannot care for students requiring treatment by specialists or admission to a general hospital. However, the staff will provide emergency treatment and assist in transferring student-patients to a general hospital. The staff will notify the parents, guardians, or nearest relative of the patient believed to be threatened with a serious illness or thought to be in need of an emergency surgical operation.

The Student Health Center cannot be responsible for the continued medical care of students suffering from chronic diseases. The College physicians will be glad to recommend private doctors and specialists to give special care to students who need it and who are unacquainted with the physicians of Lubbock. A continuation of a student's allergy desensitization program is available as prescribed by his private doctor. A letter of authorization from his parents and a letter of authorization-instructions from his private doctor are required and will expedite this program. A service charge is made for these injections, and all the injectables are furnished by the student. Hours for these injections are 10 a.m. to 12 noon and 12:30 to 3:30 p.m., Monday through Friday.

The Student Health Center attempts to screen out all students who have communicable diseases and to control such diseases on the campus. Students may be required to have chest x-rays, immunizations, and skin tests before registration. Immunizations required are smallpox, tetanus, and poliomyelitis. All of these must have been received within five years before registration. The College requires that all students with communicable diseases be isolated until the danger of transmission has passed. Students are expected to obey the laws of the sanitary code of the city and the state. The College physicians may recommend the dismissal of any student who refuses medical advice or who willfully exposes his associates to a contagious disease.

The College is not responsible for the care of students during vacations. The Student Health Center will be closed while the College residence halls are closed. Special arrangements may be made for the continued care of patients who become ill before a vacation period begins.

Students who desire 24-hour coverage on or off the campus may subscribe to a supplementary Student Accident and Sickness Insurance Plan, which is explained in greater detail in the Student Life section of this bulletin.

Student Union. The College has invested over a million and a half dollars to create a Student Union with 88,000 square feet of floor space for the leisure time activities of the campus community. This space is divided into two ballrooms, used for social functions and banquets, a snack bar that will seat 280, a cafeteria with a capacity of over 200, a games area with billiards and table tennis, a faculty club, and seven meeting rooms of various sizes and decor that are used for meetings and catered meals. Along with the divided areas the building has several attractive lounge areas, two newsstands, and two check rooms for the convenience of all persons on the campus. The Union also provides such services as check cashing, mimeographing, poster making, lost and found department, food catering, and information.

Besides providing many facilities for student and faculty use, the Union sponsors programs to supplement the student's classroom education. To accomplish this the Union Program Council, made up of student committees, plans and presents various cultural, social, educational, and recreational programs which range from dances to fine arts festivals and from noon forums to hootenannies. All students, including freshmen, are eligible to work on the various Union committees and are urged to sign up for the committee of their choice each semester at registration.

Hours of operation of the Union are 7:30 a.m. to 10:30 p.m. weekdays, and 7:30 a.m. to 11:30 p.m., Friday and Saturday. The Union is open from 2 until 10:30 p.m., Sunday. The Director of the Student Union is on the staff of the Dean of Student Life.

Texas Tech Press. Since its activation, the Texas Tech Press has done the printing and publishing for the College. This service includes books, magazines, booklets, catalogs, bulletins, programs, reports, announcements, letterheads, envelopes, office forms, and registration material. The Press also binds and rebinds books, periodicals, and magazines for the Library and for

other departments. It is among the most modern and best equipped plants in the state.

Textile Research Center. The objectives of the Textile Research Center are to improve textile processing techniques and products, using cotton, wool, and mohair and blends of these fibers with other textile materials; to evaluate the characteristics of natural fibers; to provide facilities and skilled personnel to help train students in textile science and engineering; and to assist the textile industry of Texas in solving problems from processing raw stock to finishing procedures.

The facilities include a testing laboratory for measuring the properties of cotton fibers, yarn, and fabric; a modern 1,000-spindle pilot plant for studying the relationships between cotton fiber properties and the variables in yarn manufacturing operations; and a weave room where experimental fabrics are woven for testing. These facilities are being enlarged to include equipment for manufacturing yarn on the woolen and worsted systems; a slasher room to prepare warp yarns for weaving; machines for knitting fabrics; improved weaving facilities; and laboratory-scale and full-scale equipment for preparing, dyeing, and finishing fabrics made of cotton, wool, mohair, and blends of natural and synthetic fibers. The addition to the Textile Research Center will also contain laboratories for performing research on new techniques for the utilization of cotton, wool, and mohair.

The Textile Research Center has a continuing history of service in aiding the agricultural and textile interests of Texas. The testing laboratory evaluates the properties of cotton fibers for research organizations and government agencies in Texas, as well as in other areas of the country. The spinning laboratory has performed numerous studies for the Cotton Research Committee of Texas, the Plains Cotton Growers, the United States Department of Agriculture, and other institutions.

One of the most useful studies recently performed was an investigation of the processing characteristics of light spotted cotton, which demonstrated that this cotton was equivalent in spinning performance and product quality to higher grades of cotton. The results of this work have brought millions of dollars to Texas farmers.

Traffic-Security Department. This branch of physical plant operations is under the supervision of the Vice President for Business Affairs. It provides security for the entire college plant and community (which is much larger than many towns in Texas) in addition to handling campus traffic and parking problems.

University Counseling Center. The College maintains the Counseling Center to help Texas Tech students in resolving academic problems, in selecting careers, in deciding on major fields of study, and in working through personal or emotional problems. Under the auspices of the center, a reading improvement course and a study skills course are available to Texas Tech students and staff. High school graduates and others who definitely plan to enter the College are also eligible to use the services of the Counseling Center.

University Theater. An educational facility of the Department of Speech, the modern, air-conditioned University Theater was completed in 1964. Designed for flexibility in production as well as enjoyment of performance, the theater contains 395 seats in aisleless, "continental" arrangement. The stage is adaptable to a variety of styles of production and, in addition to facilities for proscenium staging, has two side stages and a flexible forestage. Well-equipped and fully soundproof backstage areas include a scene shop, a costume shop, a makeup laboratory, dressing rooms, offices, and the Ruth Pirtle Green Room, a multipurpose room providing space for receptions, meetings, classes, rehearsals, and intimate arena theater productions.

A regular schedule of major dramatic productions is presented each school year under the direction of professionally qualified members of the faculty of the Department of Speech. Plays are chosen so that each student generation has an opportunity to see a representative selection of the great plays of the past and the experimental works of modern playwrights. In addition there is a repertory season each summer. Participation in productions affords laboratory experience for students in theater arts, but all students of the College are eligible to take part.

Admission and Registration

Texas Technological College seeks to admit mature students who will benefit most from its programs, and evidence of satisfactory preparation for college work must therefore be presented. As a state-supported institution, the College recognizes its responsibility to provide educational opportunities to those who show ability and desire to benefit therefrom. Prospective students are advised that persons of marginal ability stand little likelihood of making satisfactory progress in this institution. Extensive records of past performances indicate that students who either ranked in the lower half of their high school graduating classes or received a score below 800 on the Scholastic Aptitude Test of the College Entrance Examination Board will, in all likelihood, find it difficult to make satisfactory progress toward a degree at Texas Technological College.

The Dean of Admissions controls admission to the undergraduate schools of the College; correspondence concerning such matters should be directed to him at Texas Technological College, Lubbock, Texas. His office is located in the northwest corner of the ground floor of the Administration Building.

Freshman Admission Procedure. To enter the College as a freshman, an applicant takes the following steps:

1. Applies for admission on forms furnished by the Dean of Admissions.
2. Provides the Admissions office with an official transcript of his high school record. The applicant must assume the responsibility for having his records forwarded to the Dean of Admissions.

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 June 15. If a person desiring admission waits until after August 1 to file his application, it will not be possible for the Admissions office to notify him by mail of his admission status. A student desiring early notification of tentative acceptance may request his high school to submit a copy of his transcript at midterm of his senior year. This transcript must show grades through midterm and list the courses in which he will be enrolled during the last half of the year. Tentative admission may then be granted pending successful completion of high school. Upon graduation, an applicant for admission must submit a supplementary transcript showing final grades and graduation date. 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. Files a health data form. This form is to be completed and returned by a physician to the Dean of Admissions.

4. Furnishes scores on the Scholastic Aptitude Test of the College Entrance Examination Board.

5. Decides which school or degree program he wishes to enter. A student needing advice or counseling may come to the campus before registration begins and consult with any of the academic deans or the Counseling Center.

When an applicant's file is complete, that is, after his 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 his acceptance or rejection before he reaches the campus.

6. Reports to the College campus on the day indicated in the official College Calendar and in notices sent in reply to his application. All entering freshmen must report at the beginning of the freshman orientation period.

7. Pays fees on the days indicated for registration.

Freshman Preregistration Guidance Testing and Orientation. All entering freshmen are required to assemble at the College for a period of orientation prior to actual registration (see College Calendar). This program has been developed to assist the student in selecting a program of study and to aid the faculty and administration in guiding him.

Along with other credentials in support of their applications for admission, beginning students are required to submit their scores earned on the College Entrance Examination Board Scholastic Aptitude Test.

Test application blanks are supplied by the College Entrance Examination Board, Post Office Box 592, Princeton, New Jersey 08540. High school counselors and principals usually secure the application blanks for those wishing to take the tests.

It is the responsibility of the prospective student at the College to take these tests during his senior year in high school or during the following

summer. They may be taken at the College during the freshman orientation and testing periods preceding the fall and spring registration periods, but students who wait until then to take them will be delayed in registering.

Uniform Minimum Requirements for Admission. Graduation from an accredited high school is the first entrance requirement for beginning freshmen. The following units are the uniform requirements for admission to the College:

1. English	3
2. Mathematics* (algebra, geometry, trigonometry)	2
3. Social science	2
4. Laboratory science	1
5. Electives	7

Special Admission Requirements and Removal of Deficiencies. For entrance to the schools of Agriculture, Business Administration, Education, and Home Economics there are no further admission requirements beyond those listed above.

Students applying for entrance to the School of Arts and Sciences will be accepted if they meet the uniform requirements listed above. However, those who plan to major in chemistry, geosciences, mathematics, or physics must present 2 units in algebra and 1 in plane geometry. Students entering these fields must also submit scores made on the Mathematics, Level I (Standard), Test (of the College Entrance Examination Board) as part of their credentials; those who do not present these scores will be required to remove this deficiency during the first two semesters of attendance at the College.

Acceptance of freshmen by the School of Engineering is based upon the general requirements for admission to the College; however, because of the specialized nature of the programs offered, it is recommended that the student present the following units:

1. English	4
or	
English	3
Foreign Language	2
2. Algebra	2
3. Geometry	1
4. Trigonometry	$\frac{1}{2}$
5. Physics	1

Chemistry and advanced algebra or mathematics analysis, also, are strongly recommended. Physics is not a requirement for majors in the design option in architecture.

In order that those applicants displaying clear evidence of intellectual competence and professional promise may be accepted, even though they do not meet the above recommendations, special provisions have been made for their entrance.

Students planning to major in any of the engineering programs or the architecture-construction option are advised to take, in addition to the Scholastic Aptitude Test (SAT) required of all students admitted to the College, the Mathematics, Level I (Standard), Test, which is also offered by the College Entrance Examination Board. This test is required of students wishing to begin their first year of mathematics with analytics and calculus. Those who make low scores or who do not take the test will follow a special program for their first year in the School of Engineering. The Mathematics, Level I (Standard), Test should not be taken until the student has completed, or nearly completed, the second year of high school algebra and trigonometry, since both are included in this test.

A student who is admitted with deficiencies—either in tests or in courses—is required to remove these during the first two semesters of attendance at the College.

Credit by Advanced Placement and Achievement Examinations. Students who demonstrate by examination that they have gained a competent knowledge of the content of certain courses at this College, either in high school

* Related Math I and II may be accepted to satisfy the mathematics requirement in the nonscience, nonengineering majors. One unit in general mathematics may be accepted as a substitute for one of the required units in mathematics in the nonscience, nonengineering majors. Courses falling under the description of arithmetic are not accepted as one of the uniform required units in mathematics.

or by independent study, may be granted credit for this proficiency. The examinations used for credit placement of entering freshmen are provided by the College Entrance Examination Board (CEEB) and are taken in high school or are locally developed and given on the campus at the time of registration.

Chemistry: Upon request by a student, the Department of Chemistry will give an examination in any course offered by the department. Satisfactory achievement on this examination or these examinations permits the student to receive credit for the course or courses involved. Requests for such examinations should reach the office of the Chairman of the Department of Chemistry no later than August 15 prior to the opening of the fall semester or December 15 prior to the opening of the spring semester. Application forms may be secured from that office.

English: Entering freshmen who (1) receive a rank of 4 or 5 on the CEEB Advanced Placement Examination, or (2) make a score of 650 or above on the Achievement Examination and submit a writing sample judged superior will receive credit for 6 hours of freshman English.

Entering freshmen who take the CEEB Advanced Placement Examination and receive a rank of 3 may elect (1) to receive credit without grade for 3 hours of freshman English and enroll in English 134 to complete their requirements in freshman English, or (2) to enroll in proficiency sections of sophomore English in lieu of freshman English and complete their required hours of English in advanced courses. Entering freshmen who make a score of 575 or above on the Achievement Examination and submit a writing sample judged superior may elect either of the options mentioned above.

Foreign Languages: Students who satisfactorily complete a high school program of advanced study in French, German, Latin, or Spanish under the CEEB Advanced Placement Program may take the Advanced Placement Examination and may receive 3 to 6 hours of college credit. Such students should request that the results of their examination be sent to the Department of Classical and Romance Languages or the Department of Germanic and Slavonic Languages where they will be reviewed and where credit will be granted according to the following criteria:

1. Students making scores of 2 and 3 will receive 3 hours of credit equivalent to the 331 course in the language presented.
2. Students making scores of 4 and 5 will receive 6 hours of credit equivalent to the 331 and 332 courses in the language presented.

History: Credit will be given for History 131 and 132 and/or History 231 and 232 to students who make scores of 4 or 5 on the CEEB Advanced Placement Examinations in European and/or American History. Examinations with scores of 3 will be reviewed by the departmental faculty. Students receiving such credit for History 231 and 232 must present an advanced course in American or Texas history for graduation.

Mathematics: Competence necessary to secure credit in mathematics may be demonstrated by a score of 3, 4, or 5 on the CEEB Advanced Placement Examinations in those areas for which such examinations are nationally available.

Physics: Credit will be given for either Physics 141 and 142 or Physics 143 and 241 to students who make a score of 3 or better on the CEEB Advanced Placement Examination.

Admission of Out-of-State Students. An applicant for admission who is not a legal resident of Texas (for tuition purposes) must meet the following minimum requirements:

1. Have been graduated from an accredited high school with at least the 15 units listed above under Uniform Minimum Requirements for Admission.
2. Have ranked in the top half of his high school graduating class.

Admission of Mature Students on Condition. A mature student (21 years of age or over) who did not graduate from high school and who has not attended another college may be admitted conditionally as a freshman without having met the formal requirements for admission. Such admission is granted only to an applicant who shows that he is above average in ability and who has not recently attended high school. His admission must be recommended by the Committee on Admissions. The applicant must forward a complete transcript of his high school credits when applying for admission as a mature student. He should apply for an interview at the Admissions office a minimum of 30 days before the opening of the semester. He may then be directed to the Counseling Center to take the tests required for this type of admission.

Admission of a person as a mature student places him under special obligation to justify the exception made. He will be assigned to the program of his choice, but neglect of work or other evidence of lack of serious purpose on the part of a person with this standing will be sufficient cause for withdrawal of his status as a student. A grade average of at least a C (2.00) on the first 30 hours of residence work will absolve all admission requirements.

Admission of Foreign Students. Graduates of foreign secondary schools who believe they have completed the equivalent of at least an American high school diploma may apply for admission to Texas Technological College by writing to the Dean of Admissions. With the official application form, foreign applicants should enclose original documents, or official certified copies, indicating the nature and scope of their educational program. A student whose native tongue is not English should also present evidence that he has enough competence in the use of the English language to enable him to pursue a regular program of study in an American university. Texas Technological College does not offer special courses in English for students deficient in that subject.

Foreign students who are not in the United States at the time of application should apply a year in advance. A foreign student will not be admitted to the College until he can prove his ability to support himself financially (a minimum of \$2,000 for the academic year in addition to travel money is necessary).

Admission From Other Colleges and Universities. Undergraduate students who have attended another accredited college, who are in good standing there, and who are not under disciplinary or scholastic difficulty may be accepted for admission to Texas Technological College if their performance at the other institution meets the standard at Texas Tech.

The student seeking admission from another college must present official transcripts of his entire academic record, both high school and college. His record must meet the minimum standards in one of the following categories:

- A. If he originally enrolled for 12 or more semester hours during the last semester in attendance, and
 1. Has registered for only one semester in college, he must have earned at least 6 semester hours of academic credit with grades of C or better in each course of the total 6 semester hours. (This does not mean a "C" average. One or two hour courses in Choir, Orientation, Band, Physical Education, ROTC, etc., are not counted for admission purposes to meet these requirements.)
 2. Has registered for 2, 3, or 4 semesters, he must have earned at least 9 semester hours of academic credit with grades of C or better during his last semester in each course of the total 9 semester hours.
 3. Has registered for five or more semesters, he must have earned at least 12 semester hours of academic credit with grades of C or better during his last semester in each course of the total of 12 semester hours.
- B. If he originally registered for less than 12 semester hours during his last semester in attendance elsewhere, he must have passed one-half of his hours with a grade of C or above during the semester.

Students whose academic standing is so low during their last semester of attendance at Texas Technological College that they are no longer eligible to continue may not gain readmission by attending a summer session at another institution.

The student seeking admission from another college who presents less than 15 semester hours of transferable credit must submit scores earned on the Scholastic Aptitude Test of the College Entrance Examination Board and an official copy of his high school transcript.

Transfer of Credits From Other Colleges and Universities. In general credit hours earned at another accredited institution with grades of C or better are accepted for transfer to Texas Tech. Transcripts are evaluated by the Admissions office to determine eligibility to enter Texas Tech and by the dean of the school in which the student seeks admission to determine which courses completed at another institution can be accepted toward the degree sought at Texas Tech.

At the option of the academic dean, transferred courses with a grade of D or the equivalent may not be accepted for credit toward requirements for the degree. Transfer credit in physical education activity courses, or substi-

tutes 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 transferring credits from a nonaccredited institution must validate all such credits by earning a 2.00 grade average on the first 30 hours of residence work at this College. The student may be dropped at any time he falls below a 2.00 average during the first 30 semester hours of work at Texas Technological College. Students inadmissible to this College at the time they were admitted to a nonaccredited institution must pass required testing before being admitted here.

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

Admission of Graduate Students. Full details of admission requirements for those wishing to enter the graduate program at Texas Technological College are published in the *Graduate Catalog*, which is issued annually. A copy may be secured from the office of the Dean of Admissions. It may be noted here, however, that 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 Examination. This may be done before enrollment or at the first examination date thereafter.

Concurrent Registration at Texas Technological College and Other Institutions. A student registered at Texas Technological College who wishes to register concurrently at another institution must obtain written approval from his academic dean at Texas Technological College. 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 Technological College must have written approval from his institution and make application for concurrent registration with the Dean of Admissions at Texas Technological College.

In no case will a student at the College be authorized to register concurrently for more than one course per semester at another institution, nor will a student from another institution be permitted to register concurrently for more than one course per semester at Texas Technological College.

Concurrent registration is not permitted during the summer session.

Registration. Each semester and summer term opens with a registration period during which the formal process of enrollment in the College is completed. Prior to registering for each semester or summer term, each student who completes the admission process is furnished preregistration materials with his notice of admission. These materials include the application for a registration permit and a form on which the student must indicate his local Lubbock address.

The student should complete and return these forms to the Registrar as soon as possible so that he may have a Permit to Register processed and be assigned a registration time. If time permits, the student will be notified by mail when to report for registration. Duplicate permits are not processed until the last day of registration, regardless of the registration time on the original permit.

Scholastic Order for Registration. Priority for time of registration is based upon the total number of hours a student has passed plus the total number of grade points he has acquired. These data, accumulated each spring, determine the student's "Registration Number" for both the following fall and spring registrations.

Registration numbers for transfer students are based upon the hours and grade points accepted for transfer, but if transcripts are not on file or other data are delayed, transfer students will not receive scholastic order registration numbers until the following academic year.

Graduate students are assigned registration times in the order that registration materials are returned. Freshmen—students with less than 32 semester hours—are assigned registration times by random selection. This means that each freshman has an equal chance of being assigned any of the scheduled times to register. Exceptions to any of the assigned registration times cannot be made.

Matriculation Number. The Matriculation Number is the student's Social Security number. This number must be furnished on all forms where it is

requested. It is the primary means for maintaining student's academic records. Prospective students who do not have Social Security numbers should apply through their local post offices (or Social Security offices) in time to secure numbers prior to application for admission.

Stop Enrollment. Insufficient information or improper information given by the student on any admission or registration form will constitute cause for the student to receive a "Stop Enrollment" card or "Notice of Permit Delay" in lieu of his regular Permit to Register. Suspension or probationary status also constitutes cause for the same action.

Name Change. Students who have a change in name after their last registration must provide a certified COPY of the marriage certificate or COPY of court order which substantiates the legal name change. These documents must be submitted to the Registrar PRIOR to the ensuing registration to be effective for that semester of enrollment. Registration under a name different from the student's last enrollment cannot be accomplished without the above documents, which become a part of the student's permanent record file. All grade reports and transcripts are issued under the student's LEGAL name as recorded in the Registrar's office.

Transcript Service. Students may request copies of their academic records accumulated while at Texas Technological College as well as work transferred to the College. The first copy of a student's record, in whole or part, is furnished free of charge. Thereafter, a charge of \$1 per copy is assessed the student, payable in advance. Adequate advance notice of requests, normally one week, is required for transcript processing. All transcripts must be requested by the student and all requests must be made in writing.

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 his major subject may enroll for courses carrying graduate credit, subject to the approval of the dean of his school 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.

Unless he has previously taken it, an undergraduate student who is permitted to enroll for graduate credit as indicated above is required to take the Aptitude Test of the Graduate Record Examinations at the first administration of it after his enrollment 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 secure 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. A student who wishes to request a change in his schedule after it has been approved at registration must originate the request in the office of his academic dean who must approve the change. No course may be dropped during the last two weeks of a semester or the last week of a summer term. A fee of \$3 will be charged for each approved request. The College reserves the right to make changes in a student's schedule, for which no fee is charged.

All changes in schedules, 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 school in which the course is offered. Permission may be denied if the classroom is crowded. 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 College are those of the Vice President for Business Affairs, the Business Manager, the Comptroller, and the Purchasing Agent. Other services related to the business offices are Addressing Service, Campus Concessions, Data Processing, Environmental Health and Safety, Mail Service, Mimeograph Service, Property Inventory Control, and Telephone Service.

The Vice President for Business Affairs is the chief executive of all the fiscal operations of the College. In addition to the supervision of the various business offices, he is primarily responsible for the multi-million dollar physical plant and for advising the President and the Board of Directors on all financial matters. He is also the chairman of the Campus Planning Committee, the agency responsible for planning physical growth.

The Business Manager is the immediate supervisor of the offices of the Comptroller and Purchasing Agent and the other business-related services. He also functions as the principal assistant to the Vice President for Business Affairs.

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

The Purchasing Agent handles purchases of all College equipment, most of which are channeled through the State Board of Control.

Payment of Fees. All fees are payable in full at the time of registration, and a student is not registered until his fees are paid in full. Payment may be made by cash, checks printed with the magnetic ink characters, or money orders, but all checks, drafts, or money orders are accepted subject to final payment. Texas Technological College reserves the right to change fees in keeping with acts of the Texas State Legislature or the Board of Directors.

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

Each student should have approximately \$390 available at the time of his first enrollment. All registration expenses must be paid in full at the time of registration.

To enable the resident student to approximate his expenses at the time of entering college, the following estimates are offered:

	Fall	Spring
Registration Fee	\$ 50	\$ 50
Laboratory Fees (estimated)	4	4
Student Services Fee	21	21
Student Union Fee	5	5
General Property Deposit (new student)	7	
Books and Incidentals (estimated)	65	50
Building Use Fee	25	25
Total (estimated)	\$177	\$155

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

The student who is not a resident of Texas should add an additional \$150 per semester to the above estimate to cover the nonresident tuition fee.

The cost of books and supplies will vary with the different curricula of the College. Engineering students are required to purchase their own drawing

equipment, slide rules, etc., which, plus books, cost approximately \$100 the first year, or an average of \$50 per semester.

Registration Fee for Texas Resident Students. Each resident of Texas enrolled for 12 or more semester credit hours pays a registration fee of \$50 per semester. Those enrolled for less than 12 semester hours pay fees on the following basis:

For 11 semester hours—\$47	6 semester hours—\$27
10 semester hours— 43	5 semester hours— 23
9 semester hours— 39	4 semester hours— 19
8 semester hours— 35	3 semester hours
7 semester hours— 31	or less— 15

Registration Fee for Non-Texas Students. Each nonresident (out-of-state) student is required by an act of the Texas Legislature to pay a nonresident registration fee of \$200 per semester of the long session. A nonresident student enrolled in the long session for less than 12 semester hours pays fees on the following basis:

For 11 semester hours—\$184	6 semester hours—\$100
10 semester hours— 167	5 semester hours— 84
9 semester hours— 150	4 semester hours— 67
8 semester hours— 134	3 semester hours
7 semester hours— 117	or less— 50

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 the student in properly determining whether or not he qualifies as a resident of the state for tuition purposes. If there is any possible question whether or not he qualifies as a resident of Texas, the student should confer with the Dean of Admissions. For each improper registration there may be a penalty of \$10 in addition to the proper fee. A copy of the law defining nonresidents is available in the Registrar's office. There can be no change in residence status except upon express authorization by the Dean of Admissions.

1. A student under 21 years of age is considered to be a resident student if his parents are living in Texas at the time of his registration and have lived in the state continuously for at least the 12 months immediately preceding his registration.

2. If the parents of a resident student move out of the state, that student will be classified as a nonresident for all future semesters.

3. If his parents are divorced, a minor has the same residence status as the parent with whom he has lived for the 12 months preceding registration. If he has not lived with either parent, and there is no court-appointed guardian, the minor takes the same residence as the parent with whom he last lived. If he has lived with or been dependent on a grandparent for more than a year preceding registration, a minor takes the same residence as the grandparent. If custody is granted to some person other than a parent, the minor takes the same residence as that person for as long as he actually makes his home with such person.

4. A student over 21 years of age who comes from outside of Texas is considered to be a nonresident unless he has resided in the state for the full 12 months immediately preceding his enrollment and has not been enrolled in an educational institution during that time.

5. A student classified as a nonresident when he first registers will continue to be considered a nonresident while a student, unless he provides conclusive evidence (such as buying a homestead with a substantial down payment, full-time employment prior to registration, entering business) of his intention of becoming a permanent resident. But the student still must reside in the state 12 months before becoming eligible for reclassification as a resident student. Such reclassification will not be granted merely by taking out of a Texas driver's license or paying personal property taxes.

6. Every student classified as a nonresident retains that status until he applies in writing to the Dean of Admissions for reclassification

as a resident, and until he obtains the reclassification in writing from that dean.

7. The residence of a wife is that of her husband. Therefore, a woman student who is a resident of Texas and who marries a nonresident will be considered a nonresident and will be required to pay the nonresident tuition fee in subsequent semesters. A nonresident woman student who marries a resident of Texas is entitled to reclassification as a resident student upon submission of evidence of her marriage and of her husband's residence.

8. An alien is considered to be a nonresident unless he has applied for naturalization in the United States. An alien who has petitioned for citizenship has the same opportunity to qualify for status as a resident of Texas as do citizens of the United States. His 12-month period required to establish residency begins with the acceptance of his petition.

9. Persons in the military services who are assigned to duty in Texas are considered as residents. The actual duty station must be here, and the person must be paying his own tuition. Military personnel may enroll themselves, their wives or husbands, and their children by paying the tuition fees and other charges paid by regular residents of the state, without regard to the length of time such officers enlisted men, selectees, or draftees have been stationed on active duty within the state. While enrolled at the College, the wife or child of military personnel must have on file in the Registrar's office a form from the commanding officer of the student's husband or father certifying the student's status as a military dependent and to the fact that the husband or father is stationed in Texas or retains his permanent home or residence in the state of Texas as indicated in his personnel records.

10. Regular employees of Texas state institutions of higher learning shall be permitted to register themselves and members of their immediate family by paying resident tuition without regard to length of time resided within the state.

Veterans' Exemptions From Fees. Men and women who were legal residents of Texas at the time of entry into the Armed Forces, who have been legal residents of Texas for a period of not less than 12 months immediately preceding their registration in Texas Technological College, and who hold an honorable discharge from the Armed Forces of the United States after service during the Spanish American War, World War I, World War II, or the Korean War, are by state law exempt from the payment of all fees except library and laboratory fees or similar deposits and fees, or charges for room and board. These exemptions also apply to the children of members of the United States Armed Forces who were killed in action or died while in the service during World War II or the Korean War. Exemptions are not granted to persons who were discharged from the services because of being over the age of 38 or because of a personal request on the part of such person to be discharged from such service.

Discharge papers must be presented by the student to the Coordinator of Veterans' Affairs, who will in turn certify the student's eligibility to the Comptroller's office.

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

Miscellaneous General Fees.

1. *General Property Deposit:* Each student enrolled in the College must make a general property deposit of \$7. This deposit is subject to charges for property loss, damages, breakages, or violation of rules in the Library or laboratories.

If the charges incurred for any semester reduce the deposit by 50 percent, the student, upon notice from the Comptroller, will be required to restore the deposit to its original amount by paying the charges at once; pending payment, no credit will be allowed for the work of that semester or term, and the student will be ineligible to reenter the College. At his request this deposit, less charges, will be returned to the student upon termination of his tenure here as a student. Deposits will be held at least 60 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:* A laboratory fee of \$2 per semester is charged for all courses in which the combined lecture and laboratory credit is from 1 to 3 semester hours. For courses in which the semester credit is 4 semester hours or more the laboratory fee is \$4 per semester.

3. *Student Services Fee:* Every student must pay a \$21 fee each semester of the long session if he is enrolled for 6 semester hours or more.

4. *Student Union Fee:* This is a \$5 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 \$25 fee authorized by state law to be paid each semester of the long session by every student enrolled for 3 semester hours or more.

6. *Fee for Change in Class Schedule:* Each time a student initiates a change in his previously approved class schedule he must pay a fee of \$3 for each approved request. No charge will be made when the change is made for the convenience of the College. This fee will not be collected after the tenth week of any semester.

7. *Auditing a Course for No Grade:* 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. (See section titled "Enrollment Without Credit.")

8. *Graduation Fee:* Graduating students will be charged a graduation fee of \$5 for each degree granted. The fee will be refunded, provided the student cancels his graduation intentions 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, he will be charged \$2 for reordering the diploma insert. If both the insert and the cover have to be reordered, the charge will be \$5, as in the initial order.

A student who is graduated in **absentia** must pay an additional fee of \$1.50.

9. *Replacement of Lost ID-Activity Cards*: Students who lose their ID-Activity cards may have them replaced by paying the charges as indicated by the following schedule:

Fall	Spring	Cost
After Oct. 15	After March 1	\$15
After Nov. 15	After April 1	10
After Dec. 15	After May 1	5

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

11. *Transcript Fee*: Transcript service is provided by the office of the Registrar at a charge of \$1 per copy. For details see section entitled "Transcript Service."

Miscellaneous Special Fees.

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

Applied Music 115, 116, 145, 146, 215, 216, 315, 316	\$15.00
Applied Music 125, 126, 225, 226, 235, 236, 245, 246,	
325, 326, 345, 346, 425, 426, 435, 436, 445, 446, 535, 545	\$30.00

The following charges are made for practice room use and piano rentals; they are payable at the Comptroller's office:

One hour per day per semester	\$ 5.00
Each additional hour per day per semester	\$ 2.50
Musical instrument rental for class strings, woodwinds,	
brasses (each class)	\$ 2.50

2. *Fees for Use of Gymnasium Facilities*: Students not enrolled in a physical educational laboratory course who wish to use the College gymnasium facilities will pay a fee of \$1 per semester for use of lockers, if they are available. Towel service may be secured by payment of a \$2 laundry fee plus a \$1 deposit which will be refunded upon return of the towel.

Faculty members using the gymnasium-natorium facilities will pay a \$2 fee for each fiscal year or any part of a fiscal year.

Refund of Fees. Any student officially withdrawing during a semester, either at his request or at the request of the College because of failure to comply with a condition upon which his enrollment was approved, will receive a refund on registration fees, building use fees, applied music fees, and activity fees according to the following schedule:

1st class day through 14th class day	80 percent
15th class day through 20th class day	60 percent
21st class day through 25th class day	40 percent
26th class day through 30th class day	20 percent
After 30th class day	None
For courses of less than six weeks duration	None

Refunds of tuition and fees will be made according to the above schedule except (1) in no case will fees be refunded to a student suspended from the College by College authorities, and (2) full refund of tuition and fees will be made when the College is at fault. After a student has registered for a laboratory class and has once attended the class; no refund of the laboratory fee will be made unless the College is at fault. If the student is permitted to reenter school during the same semester in which he officially withdrew or was suspended, an additional reentrance fee of \$5 will be charged.

Charges for Room and Board in College Residence Halls. All prices indicated below are subject to change without notice prior to registration date and with 10 days' notice thereafter. Payments may be made in several ways: (1) for the full nine-month period; (2) September through January; (3) February through May; (4) by the month as outlined below.

Bledsoe, Doak, Drane, Gordon, Horn, Knapp, Sneed, and West halls: \$760 for both semesters, or \$200 for September and October plus \$80 per month thereafter; \$380 for spring semester only, or \$140 for February plus \$80 per month thereafter.

Carpenter, Gaston, Thompson, Weeks, and Wells halls: \$845 for both semesters, or \$215 for September and October plus \$90 per month thereafter;

\$422.50 for spring semester only, or \$152.50 for February plus \$90 per month thereafter.

Clement, Gates, Hulen, Murdough, Stangel, and Wall halls: \$900 for both semesters, or \$228 for September and October plus \$96 per month thereafter; \$450 for spring semester only, or \$162 for February plus \$96 per month thereafter.

Chitwood, Coleman, and Weymouth halls: \$1010 for both semesters, or \$254 for September and October plus \$108 per month thereafter; \$505 for spring semester only, or \$181 for February plus \$108 per month thereafter.

The above charges are for room and board for regular double rooms occupied by two students and include the state sales tax on meals. In some residence halls there are a few rooms with private baths for which there is an additional charge of \$7.50 per month per person. If facilities are available, one student may occupy a double room for an additional charge of \$7.50 per month. No charge is made for electrical appliances; however, only certain appliances will be permitted in the rooms.

Payment for room and board is due in advance and is to be made from the first through the fifth business day of each month except at the beginning of a semester, at which time it is payable during the first five business days of the semester. An additional charge of 50 cents per day will be made after the fifth business day of the pay period. There will be no statements of account sent to the student or to the parents. A billing of the account will be at the Office of Room Reservations during the dates indicated for payments to be made. Refund of room and board to students who move out during the nine-month period will be figured on a straight percentage basis, using calendar days.

Residence Hall Reservations. An application for a room reservation in the residence halls may be secured by sending a request to the Office of Room Reservations. **Do not** send a \$40 deposit with your request. Such deposit should be made when the application is returned to the Office of Room Reservations. Please do not send the checks to the Registrar's office, as this only delays the letters. Any questions about the residence hall life or furnishings to be brought by the student should be sent to the Director of Residence Halls. General information on the residence halls will be sent to you with your application for housing. The \$40 deposit will serve as a reservation fee and will be held as a residence hall property deposit. It will be refunded, less any breakage charges, at the end of the nine-month period or if the student graduates at the end of the fall semester or is forced to withdraw at the end of the fall semester for scholastic deficiencies. The deposit will not be returned if the student moves from his residence hall at any other time during the nine-month period for any other reason; this includes the student who is dropped from school for disciplinary reasons.

Should a student find he is unable to enroll in the College, he will receive a refund of his reservation fee if notice is given to the Office of Room Reservations in writing and is postmarked not later than July 31 for the fall semester, January 10 for the spring semester, May 15 for the first term of the summer session, and June 30 for the second summer term. All unclaimed rooms in the residence halls will be declared vacant at 8 a.m. on the first day of classes, and the \$40 deposit will be forfeited. However, if the student enrolls for the semester or summer term, he will be subject to room and board charges for the space reserved until permission to live off campus is received from the Dean of Men or Dean of Women in writing and is sent to the Office of Room Reservations.

All arrangements for housing accommodations off campus must be made through the office of the Dean of Women or the Dean of Men.

Check Cashing Services. For convenience of the student, personal checks printed with magnetic ink characters may be cashed for limited amounts at the College Bookstore and the Student Union upon presentation of the student's ID card. All checks are accepted subject to final payment. Checks returned by the bank on repeated occasions will subject the student to suspension.

Student Part-time Job Opportunities. In recognition of the worthwhile student who must contribute to his finances through part-time employment, the College has arranged for assistance through the Placement Service.

It is not the policy of the College to encourage an entering freshman to seek employment. If, after careful consideration, a student finds that a part-

time job is the best solution, he should consult with the placement office staff. Letters of inquiry should be addressed to the Director of Placement.

Student Financial Assistance. Texas Technological College participates in numerous financial aid programs designed to assist students who show serious interest in their education. Such assistance is offered to students who need financial aid and who exert maximum effort toward financing their education with personal resources.

The College expects recipients of financial assistance to make full use of their family and personal funds and to request aid only in an amount which is needed to supplement their own resources. Need is the primary base of the College's decision to extend financial assistance to students. In most cases, consideration is also given to the academic potential or achievement of applicants for aid.

Texas Technological College participates in the following financial assistance programs:

- Texas Opportunity Plan
- National Defense Student Loan
- Federal Guaranteed Loans (United Student Aid Fund)
- College Work-Study Program
- Educational Opportunity Grants
- Cuban Student Loans
- The Connally-Carrillo Act

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

Inquiries concerning student financial assistance should be sent to

- The Director of Financial Aid
- Office of the Dean of Student Life
- P. O. Box 4179
- Texas Technological College
- Lubbock, Texas 79409

Applications should be filed in accordance with the following deadline dates:

Fall semester	March 1
Spring semester	October 15
Summer semester	April 1

Information about graduate fellowships, traineeships, and scholarships may be secured from the Associate Dean of the Graduate School.

Student Life

The Dean of Student Life and his staff are concerned with the general welfare of the student. They exert their efforts towards seeing that every phase of the college experience represents an opportunity for the growth of the student; they base their program on the premise that all of college life, both in and out of class, represents a real and significant part of educational development.

Student life staff members offer counseling and guidance service to all students enrolled in the College and are in a position to refer a student to the many College service agencies interested in his welfare. In addition to giving counsel and guidance on personal, social, and individual problems, the staff is prepared through training and experience to bring the student to full understanding of himself as a part of the rich and full opportunity which is a college education. The student life staff includes the Dean of Men, the Dean of Women, and their assistant deans; the Associate Dean of Men as adviser to fraternities, the Adviser to International Students, the Director of Financial Aids and his staff, and the Director of the Student Union and his staff.

Housing. The determination of the housing of all students, a part of registration, is the responsibility of the Dean of Men and the Dean of Women. The College maintains 22 residence halls which house approximately 9,000 students. The College requires that eligible students live in the College 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 on one of the bases given below are required to move into a residence hall upon notification by the College. The College 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.

Students who live with their parents or who are married and live with their wives or husbands in Lubbock or its vicinity are requested to verify their housing in the office of the Dean of Men (or Women). Students otherwise eligible to live on campus but whose health condition demands special services and living conditions, or whose part-time employment prohibits on-campus residence, or those whose relatives make available their homes at a considerable saving on room and board, must secure permission from the Dean of Men (or Women) to live off campus.

The student is required to obtain the approval of the Dean of Men (or Women) before changing his residence, and as the final step in obtaining this approval, he must file a change of address notice with the office of the Dean of Men (or Women). Failure to notify the College of his change of address may cause the student to be suspended from the College.

Residence Hall Regulation and Government. The College maintains its residence halls in the belief that the experience in group living and self-discipline which they afford is wholesome, contributes to academic achievement, and helps materially in the development of the mature person.

Residence halls are supervised by a staff of trained and experienced personnel. Each men's residence hall has a resident supervisor. Each women's hall has a counselor selected on the basis of professional training, experience, and special qualifications for the counseling and guidance of college students.

Each of the residence halls has its own student governing body which sets the pattern of living and sponsors a program of cultural, social, and recreational events.

Student Accident and Sickness Insurance Plan. Any regularly enrolled student taking 6 semester hours or more may subscribe to a supplemental Student Accident and Sickness Insurance Plan which provides 24-hour coverage on or off campus while in any hospital or under the care of any qualified physician (according to the policy provisions). The 12-month plan covers all vacations and remains in force even though the student graduates or drops out of school. The policy is effective on September 12 (or date applied for, if later) and terminates in September 12 of the following year. A married student may include his spouse and children in the 12-month plan for an additional premium. Students may apply for 9-month coverage which terminates on June 12. The deadline for enrolling is October 12 for the fall semester. New spring students may enroll at a prorated premium with coverage terminating on September 12. The deadline is February 12 for spring enrollees. This insurance is not available to students enrolling for the summer session only. Additional information concerning this insurance may be secured from the Student Senate office or the office of the Dean of Student Life or by writing Student Insurance, Texas Technological College, Lubbock, Texas 79409.

Advisement of International Students. Texas Technological College recognizes the unique problems of adjustment to a new land and culture which face the student from abroad. The College also recognizes that a full and meaningful education and the solution of problems of adjustment for international students depend in part on their association with American students, the American community and family, and the American culture.

The International Student Adviser at Texas Tech is a member of the staff of the Dean of Student Life and is responsible for all nonacademic advisement of international students. The International Student Adviser provides personal counseling, advice on the United States immigration regulations, and liaison between international students and the International Hospitality Committee of Lubbock.

Citizenship. Honesty and integrity in class work, respect for the rights of others, regard for the laws of the nation, the state, and the country, and for city ordinances, and campus regulations, reflect the ability of the college student to establish sound citizenship values. Hazing of any nature by students or faculty is absolutely prohibited at Texas Technological College.

The students of Texas Technological College are given maximum opportunity for citizenship performance. Cooperation with the plan of traffic control on campus, financial responsibility on and off campus, and respect for the privileges offered through the Identification (ID-Activity) Card are significant areas in which each student may demonstrate mature judgment.

Participation in Extracurricular Activities. The broad program of extracurricular activities of Texas Technological College is offered to students in

order to provide fellowship, opportunities for leadership, recreation, and co-operative participation with members of the faculty. Students may elect to participate in clubs and societies, publications, sports, music, drama, or forensics as their abilities and interests suggest.

Any undergraduate student not on disciplinary probation who is enrolled for 12 or more semester hours (in residence) is eligible to become a candidate for or to hold student office or to represent the College in any extracurricular activity, provided such student has a grade-point average of at least 2.00 for both the whole of his work at the College and that of the preceding semester on the complete scholastic load. For the method of computing the grade-point average, see the section of this catalog entitled "Academic Affairs." A transfer student may establish eligibility by earning a C (2.00) average on all courses at midsemester of his first semester in residence. A student with less than a 2.00 average may establish eligibility by attending summer school at Texas Tech and averaging his summer term work with his previous semester's course grades so that his average reaches 2.00.

The above eligibility standards must be met by any student who officially represents the College, is an officer or representative of a recognized club or organization, or is a member of an academic, departmental, or intramural athletic squad or committee.

A student holding a bachelor's degree is ordinarily not eligible to hold office in a student organization or to participate in College-sponsored extracurricular activities in general.

To be eligible to participate in out-of-town trips or field trips which require absence from any class other than that for which the trip is assigned, a student must have a 2.00 grade average, must not be on disciplinary probation, and must have a current academic standing satisfactory to his academic dean. Exceptions to this academic requirement for off-campus trips are student organization-sponsored trips approved by the College and beginning Saturday noon and ending not later than Monday at 8 a.m., or between the end of the last scheduled final examination and the beginning of the next registration.

Other eligibility requirements than those given above may be determined by student organizations and agencies but operate within the framework of the eligibility requirements as stated above. Eligibility rules for the Southwest Conference are administered by the Texas Tech Athletic Council.

Student Government. By enrolling in the College all undergraduate students automatically become members of the Student Association of Texas Technological College. The Student Senate serves as the executive council of the association.

The Student Senate plans, publicizes, and supervises student elections. It supports student enterprises and organizations through funds it receives from student services fees and plays a leading role in the administration of student affairs. It appoints from its membership representatives on the Artists Course Committee, the College Athletic Council, the College Awards Board, the Discipline Committee, the Student Welfare Committee, the Student Publications Committee, the Union Board, the University Speakers Committee, the Committee on Student Organizations, and the Student Traffic Court.

The Association of Women Students serves as a coordinating body in all activities concerning women students. Every woman who enrolls in the College automatically becomes a member of the association. The governing body is composed of elected officers and representatives from every women's organization on the campus. The association is a member of the Intercollegiate Association of Women Students, a national organization made up of member schools throughout the country.

At the beginning of the school year the Association of Women Students assists in orienting freshman women in college life through its Big Sister-Little Sister program and Howdy Party. Other activities include Women's Day and Dad's Day programs, the Carol of Lights, training workshops for legislators and officers of the women's residence halls, and other college service projects.

Clubs and Societies. The College feels that student organizations compatible with the ends of college education are means toward personal development. The College recognizes some 170 student organizations, whose general supervision is under the staff of the Dean of Student Life.

Recognition of these, and the plan under which they function, is the assignment of the Committee on Student Organizations, a student-faculty committee

appointed by the President of the College. Recognition of a student organization automatically gives it the right and responsibility to schedule on the Social Calendar and entitles it to the sponsorship of the College faculty and administration and to the use of such College facilities as may be designated for that purpose. The recognition of a club or society on the Texas Technological College campus is based on the assumption that such an organization satisfies a student need for professional, scholastic, social, religious, service, or common-interest expression consistent with the best college achievement.

A full descriptive list of recognized student organizations, including Greek letter fraternities and sororities, is published in the *Student Handbook*.

Religious Opportunities. The churches of Lubbock cordially invite students at Texas Technological College to become associated with them. A number of denominations maintain student centers near the campus; these are staffed with qualified advisers and leaders who assist students in planning religious and social programs during the academic year. Among active student religious groups are the Baptist Student Union, Campus Christian Fellowship, Channing Club, Christian Science Organization, Campus Advance Student Fellowship, Gamma Delta (Lutheran) Student Association, Newman Club, and the Wesley Foundation.

Each year, usually early in the spring semester, the Willson Lectures are scheduled. These four lectures are delivered by persons of national distinction in the fields of science and religion.

Cultural Opportunities. The students of Texas Technological College have a rich and full opportunity for developing cultural interests. The University Speakers Committee and the Artists Course Committee bring a varied schedule of speakers and concerts, dramatic and dance productions.

Students with cultural talent and ability have an ample opportunity for development in the Speech Department productions in the University Theater and in the 12 musical organizations sponsored by the Music Department. All eligible students, whether enrolled in those departments or not, are invited to participate.

In the city community, Civic Lubbock, Community Concerts, and Lubbock Symphony offer opportunities for students in the College both as participants and spectators. The Lubbock Theater Center, Texas Tech Museum, and the Garden and Arts Center are additional cultural resources for Texas Tech students to enjoy.

Student Publications. The *University Daily*, the College newspaper, is published daily, Tuesday through Saturday. *La Ventana* is the College yearbook, published annually. Both of these publications draw their editors, business managers, and other personnel from the student body. The Committee on Student Publications, a faculty-student committee, has general supervision of both publications. Creative writing done by students is recognized through publication in the *Harbinger*, a literary magazine issued annually by Sigma Tau Delta, the honorary English society.

Intercollegiate Athletics. Texas Technological College maintains a well-rounded program of intercollegiate athletics in football, basketball, track, baseball, golf, swimming, and tennis. It is the intention of the College to place its main emphasis on academic excellence and within this framework to conduct a superior athletic program as an integral part of campus activities. The College holds membership in the Southwest Athletic Conference and the National Collegiate Athletic Association and conducts its program under the rules and regulations of these bodies. College policy is set by the Athletic Council composed of members from the faculty, the student body, the Ex-Students Association, and two members-at-large who are appointed by the President. The Department of Athletics is organized under the Director of Athletics, with head coaches in each of the sports responsible to the director.

Intramural Sports. Students not participating in intercollegiate activities are offered a variety of team and individual sports in which they may compete. These programs are supervised by the departments of Health, Physical Education, and Recreation for Men and for Women. Participation is on a voluntary basis and enables the student to choose the sport best suited to his abilities and interests.

Musical Organizations. The College is represented by the following official touring musical organizations: Texas Tech Choir, Madrigal Singers, Opera Theater, Symphony Orchestra, and Concert Band. Students may also partici-

pate in the Men's Glee Club, Women's Chorus, Texas Tech Singers, the Stage Bands, Court Jesters, Chamber Orchestra, and Varsity Band. Each organization is under the direction of a faculty member of the Department of Music and is open to any student who is officially enrolled in the College and meets academic requirements. Each group performs a broad repertoire and gives a number of public performances annually.

Forensics and Dramatics. Students who meet general eligibility requirements may participate in intramural and intercollegiate debate, group discussions, extempore speaking, impromptu speaking, after-dinner speaking, oratory, radio speaking, prose and poetry reading, and similar events. Both contest and noncontest events are held on campus and at other colleges. Last year Texas Tech students attended 24 major debate tournaments, traveling some 15,000 miles. The Texas Tech Forensics Union and Delta Sigma Rho are active in sponsoring campus-wide speech activities.

Students meeting eligibility requirements may also participate in the plays presented by the Speech Department and in the activities of its related organizations, Sock and Buskin and Alpha Psi Omega. Participation may be in acting, stage makeup, costuming, lighting, scene design and construction, publicity, and other activities connected with play production. There are four major productions, numerous laboratory theater productions, and a summer repertory season each year.

Academic Information

Academic Regulations

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

A student is considered to be making satisfactory progress toward a degree objective when he 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 (his course load) is regulated by his 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 his extracurricular interests and activities. A student who is employed must keep his academic dean informed of the nature of his employment and his working hours.

Explanation of Course Offerings. Courses are designated by a name and number along with a descriptive title. The name normally used is that of the subject. 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 digit or digits are the distinguishing numbers of the particular course. Thus, Botany 232 is a sophomore course carrying 3 semester hours of credit.

Courses are listed in the following section of the catalog under the name of the school and department in which they are taught. The departmental lists are divided into three categories: For Undergraduates, For Undergraduates and Graduates, and For Graduates. In these categories the courses are arranged numerically by class rank. Thus, Botany 232 is found under the Biology Department listing for undergraduates.

In the departmental course lists, certain information is placed in parentheses following the course name. 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, (3:2:3) following the listing of Botany 232, Taxonomy, means that the course carries 3 semester hours' credit, that 2 hours per week are spent in lecture sections, and that 3 hours per week are spent in the laboratory. Where only one figure appears in the parentheses, the course value in semester hours is indicated.

Enrollment in One of the Schools. Each student accepted for admission will enroll in one of the eight schools of the College: Agriculture, Arts and Sciences, Business Administration, Education, Engineering, Home Economics,

Law, or Graduate. The student should consult the dean of his school whenever any question arises concerning his 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 College
- Graduation requirements and candidacy for a degree.

Change of Schools. A student who desires to transfer from one school of the College to another must first apply to the dean of the school in which he is then enrolled. A change from one school to another cannot be made effective during the semester in which the student is already enrolled; however, action may be initiated at any time to obtain a change which will be effective at the opening of the next semester.

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

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

There are no "excused absences," but when a student has a legitimate reason for being absent from class, such as illness or participation in an official trip or activity, he may establish his eligibility to make up work he has missed by presenting evidence to his instructor. Acceptable evidence includes written statements from a College physician, the student's own doctor, or the sponsor of an activity officially recognized by the College.

Academic Integrity. It is the aim of the faculty of Texas Technological College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his own any work which he has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension.

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

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

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

Grading Practices. A grade is assigned for all courses in which a student is regularly enrolled during any semester or summer term. Only through regular enrollment can a grade be earned. A passing grade may be earned only if the student is enrolled for the duration of the course; and a grade, once given, may not be changed without the approval of the student's dean.

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

The grade P 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 grade I is given only when a student's work is satisfactory in quality but, due to reasons beyond his 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 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 five weeks of a term and for a course officially dropped after that time, provided the student's work is passing at the time the course is dropped.

After the first five weeks of a semester, the grade WF is given when the student's work is not passing at the time the course is dropped or when the student is required by his dean to drop the course for failure to attend the class.

An X is shown on the grade report in those instances where, for any reason, one of the above grades is not reported by the faculty.

Midsemester Reports. After the first half of each semester, the Registrar mails a grade report to the parents of each student. Since the grades reported do not become a part of the student's permanent record, the report is only informative. The student also receives a copy of this report.

Semester Grade Reports. At the close of each semester and each summer term, final course grades are mailed to parents. A copy of his course grade report is prepared for each student. Parents' copies of grade reports are mailed to the address which the student indicates on registration forms at the time of enrollment. Changes in the mailing address for grades must be filed on the proper form provided in the Registrar's office.

Grade Points. The grades 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 taken at this College by the total number of semester hours of all courses for which the student has registered at this College, including hours of F and WF, but excluding hours for which the grade of W is received. Repeated registrations are counted in the total.

A student may repeat courses for credit with the prior approval of his academic dean. When a course is repeated, only the grade made in the last registration is used in calculating the grade-point average for meeting graduation requirements.

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

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

Honors Studies. The Honors Studies plan provides a program of enriched study to permit superior students to develop their capabilities. Administered by the deans of the two participating schools through a Faculty Honors Council and a Director of Honors, it consists of special classes, small sections, and increased counseling. The program is available to qualified freshmen and upperclassmen in the schools of Arts and Sciences and Business Administration. Entering freshmen may participate in the program on the basis of the Scholastic Aptitude Test or other College Entrance Examination Board scores, high school records, and interviews. Students other than entering freshmen who have achieved outstanding academic records while in college are also eligible for participation. Once a student has entered Honors Studies, his record is reviewed periodically by his major adviser and by his school Honors Council in order to counsel him and to determine whether he should remain in the program. To continue in Honors Studies students must maintain the grade averages and take the minimum number of Honors courses (which are identified on transcripts with the letter H) prescribed by their schools and departments.

Dean's Honor List. A full-time undergraduate student who earns a grade-point average of 3.00 or higher during a semester is eligible for the Dean's

Honor List of the school in which he is enrolled during that semester. Attainment of a place on this roll is indicative of high scholastic achievement.

Annual Recognition Service. A Recognition Service each spring honors those students who rank scholastically in the upper 3 percent of their class within their school during either of the preceding two regular semesters and who have a grade-point average of 3.25 or higher in the other semester. Students who are honored for the first time receive Individual Honors; those recognized for the second time receive Class Honors; those recognized for the third time receive School Honors; and those recognized for the fourth time receive College Honors and are awarded a gold key by the College.

When two-thirds of the members of a student organization earn grade-point averages of 3.00 or higher during a semester, the organization is honored at the next Recognition Service.

Also recognized are undergraduate students who hold scholarships awarded by the College and who have maintained a grade-point average of 3.00 or higher during the spring and fall semesters preceding a service.

At the annual Recognition Service the College Awards Board, a student-faculty committee, recognizes outstanding individual students and student organizations for services and performances which bring distinction to the College. Also honored at the Recognition Service are students who have made significant contributions in leadership.

Graduation With Honors. Those members of a graduating class who complete their work with a grade-point average of 3.80 or above are graduated *With High Honors*, and those who complete their work with a grade-point average of 3.50 to 3.80 are graduated *With Honors*. Appropriate designation of the honor is made on the diploma and on the commencement program. No person is considered for graduation honors unless he has completed at least one-half of his degree credit at this institution, and the half must include the senior year. Only grades earned at this College are counted.

Suspension and Retention. Certain principles have been utilized in developing the regulations governing eligibility to reregister, suspension by the academic dean, and reinstatement following suspension. These principles include: (1) the College's belief that, so long as its resources permit, each bona fide applicant should be given opportunity to demonstrate his ability to perform acceptable work; (2) the belief that the early assumption of responsibility for one's own actions is a part of the educational process; (3) the belief that the College has a particular obligation to the able student; (4) the recognition that discouragement and mistakes are more likely to occur during the early stages of one's college career than in later semesters.

In addition, the regulations reflect the College's experience that a student's performance over a calendar year will likely provide a better measure of his ability than will his performance in a single semester. Finally, the standards become progressively more rigorous as the student moves toward his degree objective.

1. *Eligibility to reregister:* The determination of a student's eligibility to reregister is made only at the close of the spring semester and depends upon (1) the semester hours passed in the spring semester or in the last semester attended, and (2) the total number of semesters in which the student has registered in all colleges attended.

a. The requirement for a student who originally registers for 12 or more semester hours during the last semester attended is:

(1) The student who has registered for only one semester in college must earn at least 6 semester hours of credit.

(2) The student who has registered for two, three, four, or five semesters must earn at least 9 semester hours of credit in the last semester attended.

(3) The student who has registered for six or more semesters must earn at least 12 semester hours of credit in the last semester attended.

b. The student who originally registers for less than 12 semester hours in his last semester in attendance must earn credit for at least half of the semester hours for which he registers during that semester.

2. *Suspension by the academic dean:* Any student who fails to perform his academic duties satisfactorily may be suspended by his academic dean at any time.

3. *Period of suspension:* A student suspended by his academic dean, or a student who is not eligible to reregister because of his academic record as

indicated in Section 1, a or b, above, may not apply for reinstatement until the following periods have elapsed:

a. First suspension: one semester.

b. Second suspension: two semesters. Following this interval, approval by the Committee on Admissions must be obtained before the student may reregister.

A student's application for reinstatement is evaluated on the basis of his record at the close of the last semester attended or, in the case of a withdrawal, on his record at the time of his withdrawal from college.

A student seeking reinstatement must apply to the Dean of Admissions at least 30 days before the opening of the semester for which he desires to register. As a condition of reinstatement the student may be required to undergo such testing and counseling as his academic dean considers necessary.

Withdrawal From College. A student who finds it necessary to withdraw from the College before the end of a semester or summer term must apply to the dean of the school in which he is enrolled for permission to withdraw with honorable dismissal. A student under 21 years of age should first consult his parents and should secure from them a written statement showing that he has their permission to withdraw. When the student's academic dean is convinced that withdrawal is necessary, the student will receive honorable dismissal from the College and his parents will be notified. Such withdrawal protects the student in case he desires to return to this institution or to transfer to another. 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 standing on the last day of enrollment in each course in which he is registered.

A student who withdraws from a residence course with a grade of W may complete that course through the Division of Extension 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.

Division of Extension

For those who cannot attend regularly scheduled classes the Division of Extension offers approximately 200 courses by correspondence. Correspondence and extension class study courses have been approved by the Association of Texas Colleges and Universities. The Division of Extension is a member of the National University Extension Association.

Extension Department. At the request of a sufficient number of students, extension classes may be organized in convenient centers. The number of students required to justify the organization of such a class increases with the distance from the campus. Both graduate and undergraduate work may be made available.

Registration fees for extension class courses are \$15 per semester hour credit. Laboratory fees may be required for courses entailing laboratory work. All fees are paid in advance and are not refundable after a course is started.

A maximum of 6 hours of extension class credit will be allowed toward a master's degree. One-fourth of the work for a bachelor's degree may be earned through extension classes and/or correspondence study work (provided not more than 18 semester hours are done through correspondence study alone).

Correspondence Department. The control of a student's program by his academic dean includes correspondence and extension work, and a student in residence at this College may begin or continue correspondence or extension work only with the approval of his academic dean.

Correspondence courses taken for college credit are equivalent in content to correspondence residence courses and require a comparable amount of work. Each such course for which college credit is received must be concluded by a final examination taken under the supervision of a designated examiner at an approved college.

A student at Texas Technological College may do 18 semester hours of his work for a bachelor's degree through correspondence courses. No student may register for or complete a correspondence course during the last semester or summer term before graduation, unless registration is approved by his academic dean because of schedule conflict or the absence of the needed course

in the residence schedule. In any event no more than 6 hours of the final 30 hours may be completed by correspondence, providing the work does not constitute a part of the major or minor requirements toward the degree.

If he is enrolled full time in both long and summer sessions and carries a normal course load, a student pursuing a degree program at Texas Technological College may not complete more than 6 semester hours by correspondence during any 12-month period beginning September 15. If his course load is more than 15 hours per semester, or 6 hours each summer term, the dean of the student's school may reduce the above maximum of 6 hours by correspondence. If the student should not be enrolled during a semester, or during either or both terms of the summer session, the dean may permit a proportionate increase in the amount of correspondence work to be completed in any 12-month period beginning September 15.

If a student receives a grade of F in a course taken in residence at this College, he may not subsequently take that course by correspondence for credit. Failure in residence of a course for which there are alternate choices in meeting degree requirements precludes the taking of the alternate course, or courses, by correspondence.

The registration fee for each semester hour is \$15. Thus a course carrying 3 semester hours credit costs \$45. All fees are payable in advance and are not refundable. A correspondence course may not be exchanged for another course or transferred to another person.

If a course carries 2 semester hours credit it may not be completed until 30 days or more from the date of registration; a course carrying 3 semester hours credit may not be completed earlier than 45 days from the date of registration.

College entrance (or high school credit) courses are available in the following fields: agriculture, business, English, foreign languages (French, German, Latin, and Spanish), history and social sciences, mathematics, and physics.

Inquires concerning specific courses should be addressed to the Division of Extension, Texas Technological College, P.O. Box 4110, Lubbock, Texas 79409.

College Level Correspondence Courses. Some courses for which there is an unusually heavy demand are offered by correspondence through the Division of Extension. These courses are the same as the regular lecture courses in all general particulars, including course number and semester hours of credit, and are taught by regular members of the faculty in the department indicated. Students should note carefully all regulations pertaining to correspondence work described above.

The following are the college courses taught by correspondence:

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| <i>Accounting</i> | 422. The Book of Revelation. |
| 231. Industrial Accounting for Engineers. | <i>Business Law</i> |
| 234. Elementary Accounting I. | 338. Business Law I. |
| 235. Elementary Accounting II. | 339. Business Law II. |
| 322. Payroll Accounting. | 3313. Oil and Gas Law. |
| 334. Intermediate Accounting I. | <i>Education</i> |
| 335. Intermediate Accounting II. | 430. History and Philosophy of Education. |
| 336. Principles of Cost Accounting. | 4331. Foundations of Educational Sociology. |
| 430. Income Tax Accounting. | 4344. Children's Literature. |
| 432. Governmental Accounting. | <i>English</i> |
| 434. Advanced Accounting I. | 131. College Rhetoric. |
| 435. Advanced Accounting II. | 132. College Rhetoric (Continued). |
| 437. Principles of Auditing. | 231. Masterpieces of Literature. |
| <i>Agricultural Economics</i> | 232. Masterpieces of Literature (Continued). |
| 235. Fundamentals of Agricultural Economics. | 233. Technical Writing. |
| 325. Farm Laws. | 231. The Short Story. |
| <i>Anthropology</i> | 3325. American Novel. |
| 232. Cultural Anthropology. | 4336. Teaching English in Secondary Schools. |
| <i>Biblical Literature</i> | 4343. Modern American and European Drama. |
| 131. Introduction to the Old Testament. | <i>Finance</i> |
| 132. Introduction to the New Testament. | 231. Personal Finance. |
| 213. The Book of James. | |
| 236. The Life and Teachings of Jesus. | |

- 331. Corporation Finance.
- 333. Principles of Money, Banking, and Credit.
- 334. Credits and Collections.
- 336. Life Insurance.
- 432. Real Estate.
- 434. Investments.

French

- 141. A Beginning Course in French.
- 142. A Beginning Course in French (Continued).
- 231. A Second Course in French.
- 232. A Second Course in French (Continued).

German

- 141. A Beginning Course in German.
- 142. A Beginning Course in German (Continued).
- 231. A Second Course in German.
- 232. A Second Course in German (Continued).
- 233. Scientific German.
- 234. Scientific German (Continued).
- 331. German Life and Literature.
- 332. German Life and Literature (Continued).

Government

- 231. American Government, Organization.
- 232. American Government, Functions.

Greek

- 131. A Beginning Course in Greek.
- 132. A Beginning Course in Greek (Continued).

History

- 131. Development of Civilizations.
- 132. Development of Civilizations (Continued).
- 231. History of the United States to 1877.
- 232. History of the United States since 1877.
- 330. History of Texas.

Latin

- 131. A Beginning Course in Latin.
- 132. A Beginning Course in Latin (Continued).
- 231. A Second Course in Latin.
- 232. A Second Course in Latin (Continued).
- 331. Introduction to Latin Life and Literature.
- 332. Introduction to Latin Life and Literature (Continued).

Management

- 110. Professional Careers in Business.

Marketing

- 246. Introduction to Business Statistics.
- 332. Principles of Marketing.
- 433. Marketing Problems.

Mathematics

- 131. Trigonometry.
- 133. College Algebra.
- 137. Introduction to Mathematical Analysis.
- 138. Introduction to Mathematical Analysis (Continued).
- 151. Analytical Geometry and Calculus I.
- 152. Analytical Geometry and Calculus II.
- 235. Analytical Geometry and Calculus III.
- 238. Statistics.
- 332. Differential Equations I.

Philosophy

- 230. Introduction to Philosophy.

Physical Education

- 230. Methods of Teaching Health in the Elementary and Secondary Schools.
- 331. Recreational Methods.
- 439. Organization and Administration of Recreational Programs.

Psychology

- 230. General Psychology I.
- 331. Child Psychology.
- 332. Mental Health.
- 335. Adolescent Psychology.
- 433. Statistical Methods.
- 434. Intro. to Social Psychology.

Russian

- 141. A Beginning Course in Russian.
- 142. A Beginning Course in Russian (Continued).

Secretarial Administration

- 333. Business Correspondence.

Sociology

- 230. Introduction to Sociology.
- 235. The Sociology of Marriage.
- 331. Rural Sociology.

Spanish

- 141. A Beginning Course in Spanish.
- 142. A Beginning Course in Spanish (Continued).
- 231. A Second Course in Spanish.
- 232. A Second Course in Spanish (Continued).
- 331. Masterpieces of the Hispanic World.
- 332. Masterpieces of the Hispanic World (Continued).

Graduate School

Graduate study is much more than a continuation of undergraduate work. Its true spirit is one of inquiry and the desire to add something to human knowledge. Graduate study should therefore be contemplated only by students who have already demonstrated in their undergraduate programs unusual intellectual attainments and the power of independent thought and investigation.

For this reason, practically all graduate schools exercise some type of selectivity in their admission of students. Selective entrance requirements are partly for the maintenance of the high standards that must always characterize graduate study and partly for the benefit of students in helping them decide early whether they should undertake such work.

The Graduate School of Texas Technological College recognizes its obligations both to the standards mentioned above and to the citizens of Texas by a twofold classification of graduate students. In connection with the first obligation, the Graduate School requires evidence of an applicant's special ability for admission to its degree programs and reserves the right to decline to accept any applicant whose admission would not be to his best interest or that of the College. 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 or do not wish to become applicants for degrees.

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

Degrees and Degree Programs

Accounting	Geology
<i>Master of Business Administration</i>	<i>Master of Science</i>
<i>Master of Science in Accounting</i>	<i>Doctor of Philosophy</i>
Agricultural Economics	Business Administration
<i>Master of Science</i>	<i>Doctor of Business Administration</i>
Agricultural Education	Business Education
<i>Master of Science</i>	<i>Master of Business Administration</i>
Agricultural Engineering	<i>Master of Education</i>
<i>Master of Science in Agricultural</i>	Chemical Engineering
<i>Engineering</i>	<i>Master of Science in Chemical</i>
Animal Breeding	<i>Engineering</i>
<i>Master of Science</i>	<i>Doctor of Philosophy</i>
Animal Nutrition	Chemistry
<i>Master of Science</i>	<i>Master of Science</i>
Applied Music	<i>Doctor of Philosophy</i>
<i>Master of Music</i>	Civil Engineering
Biology	<i>Master of Science in Civil</i>
<i>Doctor of Philosophy</i>	<i>Engineering</i>
Botany	<i>Doctor of Philosophy</i>
<i>Master of Science</i>	Clothing and Textiles
<i>Doctor of Philosophy</i>	<i>Master of Science in Home</i>
Dairy Industry	<i>Economics</i>
<i>Master of Science</i>	Crop Science
Economics	<i>Master of Science</i>
<i>Master of Arts</i>	Horticulture
<i>Master of Business Administration</i>	<i>Master of Science</i>
Education	Industrial Engineering
<i>Master of Education</i>	<i>Master of Science in Industrial</i>
<i>Doctor of Education</i>	<i>Engineering</i>
Electrical Engineering	<i>Doctor of Philosophy</i>
<i>Master of Science in Electrical</i>	Management
<i>Engineering</i>	<i>Master of Business Administration</i>
<i>Doctor of Philosophy</i>	Marketing
Engineering	<i>Master of Business Administration</i>
<i>Doctor of Philosophy</i>	Mathematics
English	<i>Master of Arts</i>
<i>Master of Arts</i>	<i>Master of Science</i>
<i>Doctor of Philosophy</i>	<i>Doctor of Philosophy</i>
Entomology	Meat Science
<i>Master of Science</i>	<i>Master of Science</i>
Finance	Mechanical Engineering
<i>Master of Business Administration</i>	<i>Master of Science in Mechanical</i>
Food and Nutrition	<i>Engineering</i>
<i>Master of Science in Home</i>	<i>Doctor of Philosophy</i>
<i>Economics</i>	Microbiology
French	<i>Master of Science</i>
<i>Master of Arts</i>	<i>Doctor of Philosophy</i>

Music Education
 Master of Music Education
 Park Administration
 Master of Science
 Physical Education
 Master of Education
 German
 Master of Arts
 Government
 Master of Arts
 Doctor of Philosophy
 History
 Master of Arts
 Doctor of Philosophy
 Home Economics Education
 Master of Science in Home Economics
 Soil Science
 Master of Science

Spanish
 Master of Arts
 Physics
 Master of Science
 Doctor of Philosophy
 Psychology
 Master of Arts
 Doctor of Philosophy
 Range Science
 Master of Science
 Sociology
 Master of Arts
 Speech
 Master of Arts
 Zoology
 Master of Science
 Doctor of Philosophy

School of Law

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 every prelegal student should keep before him in planning his college program. He 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 himself the power to think creatively. His undergraduate training should result in not just knowledge, but an understanding of the degrees, the conditions, the why and how of his knowledge.

Two items deserve special mention. A student will find it helpful to have some preliminary work in accounting as background for the courses in business associations and taxation. Typing skills will prove useful not only in the preparation of briefs and memoranda, but also for daily preparation and examinations.

Applicants for admission to the School of Law must possess a baccalaureate degree or an equivalent degree from a college or university of approved standing prior to the time they begin their work in the School of Law. An applicant's record must be of sufficiently high quality to demonstrate that he is qualified for the study of law. In questionable cases, the work of the last two college years will be considered more heavily than that of earlier years.

Applicants must also achieve a satisfactory score on the Law School Admission Test, administered four times a year throughout the United States and in many foreign countries by the Educational Testing Service.

Students are admitted only on a full-time basis and only in the fall.

For further details consult the *Catalog of the School of Law*.

Teacher Education

The preparation of new teachers and the improvement of teachers already in service is an important function of the College at both the undergraduate and graduate levels. The coordination of the total teacher education program is a responsibility of the Dean of the School of Education who serves as Director of Teacher Education and Certification. The Teacher Education Council, appointed by the President of the College, has the authority and responsibility to approve teacher education curricula.

General advisement on specific degree requirements occurs in the offices of the several academic deans of the school in which the student is enrolled. The student may obtain advisement on certification requirements in the office of the Dean of the School of Education or from the appropriate department chairman in the School of Education. Selection of courses in the student's teaching field or area of specialization is the responsibility of the academic department involved.

Teacher Certificates. Requirements for a certificate to teach in the public schools of Texas are based on the 1955 Law on Certification of School Personnel as modified. Under this law there are two classes of teacher's certificates; these are designated as the Provisional Certificate and the Professional Certificate. Each certificate, once issued, is permanent and valid for life unless cancelled by lawful authority.

Such teacher's certificates are issued only to persons who have completed the requirements for a bachelor's degree and an approved certification program and who have been recommended by the Director of Teacher Education and Certification. Teacher certification and degree programs are two distinct programs. A student may qualify for teacher certification by majoring in elementary or secondary education or by majoring in one of his fields of academic specialization and fulfilling all certification requirements. Policies governing certification programs are administered by the Director of Teacher Education and Certification.

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

A student making application to the teacher education program must have a certification plan on file in the office of the Dean of the School of Education.

Prerequisites for admission to the teacher education program:

- (1) A scholastic grade-point average of 2.25 on all work taken prior to admission.
- (2) A minimum grade-point average of 2.25 in required English courses or demonstrated proficiency of the fiftieth percentile or above on an English proficiency test administered by the College.
- (3) Competency in speech and hearing. Competency will be determined by tests administered by the Speech Department.
- (4) Freedom from physical and health handicaps believed to be detrimental to teaching.
- (5) Good character and high ethical standards.

Certification Plan. Any undergraduate student working toward a teacher's certificate must file a certification plan in the Office of Teacher Certification during his sophomore year or during his first semester of attendance at Texas Technological College.* The student's advisers will assist him in filing the certification plan. Any graduate student working toward a professional certificate should file a certification plan in the Office of Teacher Certification following his admission to the professional certification program. The requirement for filing of a certification plan applies regardless of the degree being sought, the subject which the student expects to teach, or the level (elementary, secondary, special education, or all-level) at which he expects to be certified. Transfer students must make a certification plan during the first semester of attendance at Texas Technological College. 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 Office of Teacher Certification.

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

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

The following are prerequisites to admission to student teaching:

* A student in agricultural education or home economics education must consult his department chairman regarding the proper time to file this certification plan.

(1) The applicant must have completed a minimum of 90 semester hours of college work. A student seeking certification to teach in secondary schools must have completed a minimum of 15 semester hours required in each of the teaching fields and 9 semester hours in professional education courses. For those seeking certification in the elementary grades, the 90 hours must include (a) 24 semester hours of the 36 semester hours in the academic specialization area, and (b) the completion of Education 332 and Elementary Education 3331, 3344, and 3345, or their approved equivalents.

(2) Each student, unless he is in agricultural education or home economics education, must file an application in the office of the Dean of the School of Education to enroll in student teaching and must do so on or before April 15 preceding the school year in which he expects to register for the course.

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

(4) The applicant must present evidence that he is free from extreme handicaps that are judged by the Committee on Student Teaching to be detrimental to effective classroom instruction.

(5) The student must have a grade-point average of 2.25 or higher on all his college work and a grade-point average of 2.25 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).

(6) The student must have a grade-point average of 2.25 in required courses in English or demonstrate proficiency at the fiftieth percentile or above on an English test administered by the College.

The Committee on Student Teaching applies the above standards to transfer students on an individual basis. Transfer students must absolve the requirements above by the beginning of the junior year or during the first semester of attendance at this College, whichever is later.

Recommendation for Teacher Certification. A student who has successfully completed an approved program in teacher certification, who has maintained the levels of performance stated as prerequisites for admission to student teaching, and who meets high moral standards is eligible to apply to the office of the Dean of Education for a recommendation to the Texas Education Agency for the appropriate teaching certificate. The student making application under the above conditions will be recommended by the College to the Texas Education Agency, which is the authority for the issuance of the teacher's certificate.

Provisional Certificate Programs. Provisional certificate programs have been approved for Texas Technological College at the elementary level and at the secondary level. In addition, all-level programs have been approved which qualify the individual for certification in his special subject at both the elementary and secondary levels.

1. Provisional Certificate—Elementary: A student seeking certification to teach in the elementary (grades 1-8) schools must earn a bachelor's degree and complete approximately two years of course work in "Academic Foundations," a minimum of 36 semester hours in "Academic Specialization" courses, and 30 semester hours in professional education and elementary content courses. The requirements in professional education include 6 semester hours in student teaching.

Areas of academic specialization are art, biology, English, French, geography, German, government, health and physical education for men, health and physical education for women, history, mathematics, music, sociology, Spanish, speech, and drama.

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

Biology
Business Education
Chemistry
Drama
Economics
English
French
Latin
Mathematics

Physics
Geography
German
Government
Health and Physical Education
History
Journalism
Spanish
Speech

The student following Plan I must consult the chairmen of the departments in which he plans to qualify for certification in order to determine the specific courses which are required.

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

Art
Business Education
Music

Science
Social Science

The student who expects to teach in one of the broad fields listed above should consult the academic department in which he plans to complete the courses required in the composite area. Course work in the broad field of science must be distributed in at least three science departments, with no more than 8 semester hours in the geosciences.

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

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

3. *Provisional Certificate—All-Level*: All-level certificate programs are approved at Texas Technological College in the following fields:

Art
Drama
Health and Physical Education

Music Education
Speech

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

4. *Provisional Certificate—Teaching Exceptional Children*: Certificate programs for teaching exceptional children are approved at Texas Technological College in the following fields:

Mentally Retarded
Physically Handicapped/Minimal
Brain Injury

Speech and Hearing Therapy
Deaf

The provisional certificate in mental retardation requires the completion of the Bachelor of Science program in elementary education plus the addition of 12 semester hours of course work in special education. Student teaching is done in both the regular and the special classrooms. Students interested in the provisional certificate in either program should contact designated personnel in the Department of Special Education, School of Education, and/or the Department of Speech, School of Arts and Sciences, for specific information.

Professional Certificate Programs. The professional certificate is the highest teacher's certificate issued in Texas. Each program leading to professional certification is designed to prepare the applicant for a specific professional position. The professional certificate may be issued to a person who (1) has earned a bachelor's degree, (2) possesses at least three years of teaching experience, (3) has completed 30 semester hours of graduate course work in an approved program, and (4) is recommended by the Director of Teacher Certification. If properly planned, the graduate work may fulfill the requirements for a master's degree and a professional certificate.

At Texas Technological College, approved professional certification programs exist in the following areas:

Drama
Health and Physical Education
Music
Speech
Vocational Education
Agricultural Education
Home Economics Education

Elementary and Secondary
Special Service
Administrative
Counselor
Principal
Superintendent
Supervisor

A student wishing to work toward a professional certificate should first consult the office of the Dean of the School of Education to obtain information regarding the programs available and to make application for admission to graduate study for the certificate.

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

Uniform Undergraduate Degree Requirements

All bachelor's degrees conferred by Texas Technological College are based on the satisfactory completion of specific authorized degree programs. A student's major subject is the degree program in which he is working. The degree programs are offered through the six undergraduate schools of the College and are usually supervised by the departments in each school. For example, a degree of Bachelor of Science is conferred through the School of Agriculture upon the successful completion of the program in horticulture, supervised by the Department of Park Administration, Horticulture, and Entomology.

Requirements for undergraduate degrees, therefore, are established at these three different levels: (1) the College as a whole (Uniform Undergraduate Degree Requirements), (2) the school 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 College which apply to all undergraduate degrees conferred.

Residence Credit. The minimum actual residence required of each student is two consecutive semesters or the equivalent, and the minimum amount of residence work required is 30 semester hours applicable toward the degree sought. In addition, the student must complete the last 30 hours at this College, but these may include a maximum of 6 semester hours in correspondence course work, provided he has met the minimum residence and course work requirements stated above, and provided the correspondence courses are not the final advanced courses in the major and minor fields.

Course work taken through the Division of Extension at Texas Technological College 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 and attending classes on the campus at Texas Technological College.

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

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

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

Application for Degree. A candidate should file his application for a degree at least two semesters in advance of graduation, and must file it not later than the beginning of the semester in which he expects to receive the degree.

Any student who registers in the semester or summer session in which he expects to complete the work for a bachelor's degree, but who has less than the number of grade points required for graduation, will be granted only

conditional admission to candidacy. In this status, the student acts on his own responsibility in ordering a diploma or making other graduation arrangements.

Personnel Information Forms. Graduating seniors are required to complete Personnel Information Forms and to present two 2" x 3" glossy photographic prints for filing with the Placement Service prior to graduation. This enables the College to complete its personnel files and is required of all graduating seniors, whether or not they are seeking a position.

Requirements in Government and History. Under state law all students who receive bachelor's degrees from Texas Technological College must have received credit for 6 semester hours in government, covering the federal and the Texas constitutions, and 6 semester hours in American history; 3 semester hours in the history of Texas may be substituted for 3 of the American history hours.

Physical Education. Completion of four 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 and sophomore years. Credits in physical education activity courses or substitutes are accepted in 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. Male students who qualify for participation in aerospace studies or military science may take the basic courses (four semesters) of the four-year ROTC program or the two-year (four semesters) ROTC program in place of physical education. Once entered upon, the satisfactory completion of these courses becomes a requirement for graduation unless the student is specifically excused by the Department of Aerospace Studies or the Department of Military Science and the student's academic dean.

3. Any student who has been honorably discharged from the Armed Forces with a minimum of 90 days' service may receive credit for 2 of the semester hours in physical education normally required as part of his curriculum. With one year or more of active service he may receive credit for the 4 semester hours in physical education normally required. Application for this credit must be made in the first semester of attendance at the College following honorable discharge.

4. A student over 25 years of age may substitute 3 semester hours of academic work in physical education for the required four semesters in physical education activity work.

5. Students who have a doctor's recommendation for limited physical activity must enroll in the appropriate physical education activity courses (Physical Education for Men and Physical Education for Women). Four semester hours of credit may be earned by repeating one of these courses.

Graduation Under a Particular Catalog. A student is expected to complete the degree requirements set forth in a particular College catalog. Normally this will be the catalog in effect at the time the student enters his post-secondary school program, assuming that he has not changed from his original degree objective. For the student who changes his degree objective after beginning his college career, the degree requirements in effect when the student first registers in the school from which he receives his degree will be applicable. Only with the specific approval of his 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 *General Catalog* is published in the spring, and its provisions are applicable during the following school year, September through August. However, a student who registers for the first time in the College during a summer session is subject to the degree requirements set forth in the catalog effective for the fall semester immediately following his initial enrollment.

Commencement Exercises. Diplomas are awarded at commencement exercises which are conducted twice each year: at the end of the spring semester and at the end of the summer session. Students who complete their degree requirements in a fall semester will be awarded diplomas at the next scheduled commencement.

To receive a degree, a student must either attend the commencement exercise or receive approval for graduating *in absentia*. Application for *in absentia* graduation must be submitted in writing to the student's academic dean within the time specified in the College Calendar.

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

Programs and Instructional Departments. The following table is an alphabetical list of the undergraduate degree programs and a guide to the department directing or administering the program.

PROGRAM	SCHOOL	DEPARTMENT OR ADVISER
ACCOUNTING	Business Administration	Accounting
ADVERTISING	Business Administration	Marketing
ADVERTISING ART	Arts and Sciences	Art
AGRICULTURAL ECONOMICS	Agriculture	Agricultural Economics
AGRICULTURAL EDUCATION	Agriculture	Agricultural Education
AGRICULTURAL ENGINEERING	Agriculture	Agricultural Engineering
AGRICULTURAL SCIENCE	Agriculture	Administered by the Dean's Office
AGRONOMY, CROPS MAJOR	Agriculture	Agronomy and Range Management
AGRONOMY, SOILS MAJOR	Agriculture	Agronomy and Range Management
ANIMAL BUSINESS	Agriculture	Animal Husbandry
ANIMAL PRODUCTION	Agriculture	Animal Husbandry
ANIMAL SCIENCE	Agriculture	Animal Husbandry
ANTHROPOLOGY	Arts and Sciences	Sociology and Anthropology
APPLIED MUSIC	Arts and Sciences	Music
ARCHITECTURE	Engineering	Architecture
ART	Arts and Sciences	Art
BILINGUAL SECRETARIAL PROGRAM	(1) Arts and Sciences	Classical and Romance Languages
	(2) Business Administration	Business Education and Secretarial Administration
BOTANY	Arts and Sciences	Biology
BUSINESS EDUCATION	Business Administration	Business Education and Secretarial Administration
CHEMICAL ENGINEERING	Engineering	Chemical Engineering
CHEMISTRY	Arts and Sciences	Chemistry
CIVIL ENGINEERING	Engineering	Civil Engineering
CLOTHING AND TEXTILES	Home Economics	Clothing and Textiles
DAIRY INDUSTRY	Agriculture	Dairy Industry
ECONOMICS	Business Administration	Economics
EDUCATION	Education	Education
ELECTRICAL ENGINEERING	Engineering	Electrical Engineering
ELEMENTARY EDUCATION	Education	Elementary Education
ENGINEERING PHYSICS	Engineering	Engineering Physics*
ENGLISH	Arts and Sciences	English
ENTOMOLOGY	Agriculture	Park Administration, Horticulture, and Entomology
FINANCE	Business Administration	Finance
FOOD AND NUTRITION	Home Economics	Food and Nutrition
FRENCH	Arts and Sciences	Classical and Romance Languages
GENERAL HOME ECONOMICS	Home Economics	Interdepartmental
GEOCHEMISTRY	Arts and Sciences	Geosciences
GEOGRAPHY	Arts and Sciences	Geosciences
GEOLOGY	Arts and Sciences	Geosciences
GEOPHYSICS	Arts and Sciences	Geosciences
GERMAN	Arts and Sciences	Germanic and Slavonic Languages
GOVERNMENT	Arts and Sciences	Government
HISTORY	Arts and Sciences	History
HOME ECONOMICS	Home Economics	Home Economics Education
EDUCATION		
HOME AND FAMILY LIFE	Home Economics	Home and Family Life

* Administered by the Department of Physics in the School of Arts and Sciences, but the curriculum is presented in the catalog with other curricula of the School of Engineering.

HORTICULTURE	Agriculture	Park Administration, Horticulture, and Entomology
INDUSTRIAL ENGINEERING	Engineering	Industrial Engineering
INDUSTRIAL MANAGEMENT	Business Administration	Management
INTERNATIONAL TRADE	Business Administration	Economics
JOURNALISM	Arts and Sciences	Journalism
LATIN	Arts and Sciences	Classical and Romance Languages
LATIN AMERICAN AREA STUDIES	Arts and Sciences	Government, History, and Classical and Romance Languages
MANAGEMENT	Business Administration	Management
MARKETING	Business Administration	Marketing
MATHEMATICS	Arts and Sciences	Mathematics
MECHANICAL ENGINEERING	Engineering	Mechanical Engineering
MECHANIZED AGRICULTURE	Agriculture	Agricultural Engineering
MEDICAL TECHNOLOGY	Arts and Sciences	Biology
MICROBIOLOGY	Arts and Sciences	Biology
MUSIC EDUCATION	Arts and Sciences	Music
MUSIC THEORY	Arts and Sciences	Music
PARK ADMINISTRATION	Agriculture	Park Administration, Horticulture, and Entomology
PETROLEUM ENGINEERING	Engineering	Petroleum Engineering
PHILOSOPHY	Arts and Sciences	Philosophy
PHYSICAL EDUCATION (FOR MEN)	Arts and Sciences	Health, Physical Education, and Recreation for Men
PHYSICAL EDUCATION (FOR WOMEN)	Arts and Sciences	Health, Physical Education, and Recreation for Women
PHYSICS	Arts and Sciences	Physics
PRELAW	(1) Arts and Sciences	Special adviser in Department of Government
	(2) Business Administration	Special adviser in School of Business Administration
PREMEDICAL AND PRENATAL	Arts and Sciences	Premedical adviser in Department of Chemistry
PREVETERINARY MEDICINE	Agriculture	Animal Husbandry
PSYCHOLOGY	Arts and Sciences	Psychology
PUBLIC ADMINISTRATION	Business Administration	Special adviser in School of Business Administration
RANGE MANAGEMENT	Agriculture	Agronomy and Range Management
RECREATION (FOR MEN)	Arts and Sciences	Health, Physical Education, and Recreation for Men
RECREATION (FOR WOMEN)	Arts and Sciences	Health, Physical Education, and Recreation for Women
RETAILING	Business Administration	Marketing
SECONDARY EDUCATION	Education	Secondary Education
SECRETARIAL ADMINISTRATION	Business Administration	Business Education and Secretarial Administration
SOCIOLOGY	Arts and Sciences	Sociology and Anthropology
SPANISH	Arts and Sciences	Classical and Romance Languages
SPEECH	Arts and Sciences	Speech
TEXTILE ENGINEERING	Engineering	Textile Engineering
TEXTILE TECHNOLOGY AND MANAGEMENT	Engineering	Textile Engineering
ZOOLOGY	Arts and Sciences	Biology

School of Agriculture

The programs of this school are designed to qualify the student for a place in modern agricultural industry—an industry that encompasses three closely related segments: (1) the producers of agricultural products on farms and ranches, (2) the suppliers of machinery, fertilizers, feed, seed, and other production resources, and (3) innumerable phases of processing, storage, distribution, and other services associated with our food and fiber economy.

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

Laboratory facilities in agriculture include the 1,500-acre College Farm and approximately 14,000 acres at the Texas Tech Research Farm near Amarillo. Research in agriculture and service to the industry are a part of the program involving well qualified advanced undergraduate and graduate students. Field trips and participation in intercollegiate contests are a part of the training program, and students have at their disposal a farm which serves as a laboratory, well stocked with machinery and farm animals.

Recent surveys indicate that the agricultural industry could employ approximately 15,000 new college graduates each year. At present the major agricultural colleges graduate only about 7,500 young men and women for these positions. With these excellent opportunities for the college graduate, however, are associated demands for better training and more highly specialized skills.

The School of Agriculture participates in the graduate program at Texas Technological College with master's level work in the areas of agricultural economics, agricultural education, agricultural engineering, animal breeding, animal nutrition, crop science, dairy industry, entomology, horticulture, meat science, park administration, range science, and soil science. Details concerning these programs are available in the *Catalog of the Graduate School*.

The School of Agriculture 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. Any deviation from the approved curriculum for a particular degree must have prior approval from the chairman of the department involved and the office of the Dean of the School of Agriculture. These curricula are presented in special tables on the following pages along with a descriptive list of the courses offered by each department.

General Requirements of the School of Agriculture. All agricultural students, except those majoring in agricultural engineering, are required to take 9 semester hours of English and 16 hours of interdisciplinary agricultural courses. The different curricula all require 136 hours exclusive of physical education, band, or basic ROTC for graduation. It is expected that students enrolled in the School of Agriculture will earn credit toward a degree by following an orderly sequence of courses through consultation with the major department.

Uniform Freshman Year for Students in Agriculture. All students in the School of Agriculture (except those majoring in agricultural engineering, mechanized agriculture, or preveterinary science) follow a uniform freshman curriculum and need not designate a major interest during the freshman year.

These uniform requirements include a series of orientation lectures, survey courses in various departments of agriculture, and basic training in biology, chemistry, mathematics, and English.

Required freshman courses should be taken during the freshman and sophomore years. Students who postpone taking required freshman subjects until the senior year must still take such subjects, but credit will not apply toward the hours required for a degree. (For purposes of this regulation a senior is considered as a student with a minimum of 96 hours.)

FRESHMAN YEAR

Fall		Spring	
AGED 111, The Ag. Industry	1	AECO 235, Fund. of Ag. Eco.	3
AGRO 131, Fund. of Agron.	3	CHEM 141, Gen. Chem.	4
AH 131, Gen. Anim. Science	3	ENG 132, Coll. Rhet.	3
BIOL 141, Botany	4	DI 131, Prin. of Dairy & Food Indus.	3
MATH 137, Intro. Math. Anal. or		HORT 131, Prin. of Hort.	3
MATH 133, Coll. Algebra	3	P.E., Band, or Basic ROTC	1-2
ENG 131, Coll. Rhet.	3		
P.E., Band, or Basic ROTC	1		
			17-18
	18		

Agricultural Science Major. An interdepartmental curriculum for the agricultural science program is supervised directly by the Dean of the School of Agriculture. Course work, as indicated in the accompanying curriculum table, is provided in various departments.

Only those students who by their freshman entrance test records are placed in the top 10 percent of their class, or those capable of maintaining an average of B or above, should follow this curriculum. Students electing it must agree to be available for summer employment for two years, the place of employment to be approved by the curriculum adviser.

Agricultural Science Curriculum.

FIRST YEAR

(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
CHEM 142, Gen. Chem.	4	MATH 131, Trig.	3
English (200 level or above)	3	Biol., Bot., Mbio., or Zool.	
BIOL 142, Zoology	4	(200 level or above)	3
P.E., Band, or Basic ROTC	1-2	English (200 level or above)	3
Ag. courses and electives	6	P.E., Band, or Basic ROTC	1-2
		Ag. courses and electives	8
	18-19		18-19

THIRD YEAR

Fall		Spring	
*CHEM 341, Intro. to Org. Chem.	4	Biol., Bot., Mbio., or Zool.	
GOVT 231, Amer. Govt., Org.	3	(200 level or above)	3
PHYS 141, Gen. Phys.	4	*CHEM 342, Physiol. Chem.	4
Ag. courses and electives	6	GOVT 232, Amer. Govt., Func.	3
		PHYS 142, Gen. Phys.	4
	17	Ag. courses and electives	3
			17

FOURTH YEAR

Fall		Spring	
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
Ag. courses or basic sciences and electives	15	Ag. courses or basic science and electives	14
	18		17

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136; 41 hours of total must be taken in the School of Agriculture.

* May substitute CHEM 325, 326, 335, 336.

Department of Agricultural Economics

This department provides training leading to *Bachelor of Science* and *Master of Science* degrees in AGRICULTURAL ECONOMICS. Concerned with all business and economic aspects of agriculture and marketing to and including the consumer, the department provides five special areas of undergraduate emphasis: Agribusiness Management, Farm Management, Ranch Management, Rural Socioeconomics and Agricultural Economics Research. Training in agricultural credit, farm appraisal, agricultural policy, price analysis, and agricultural marketing also is provided.

Agricultural Economics Curriculum.**FIRST YEAR**
(See Uniform Freshman Year)**SECOND YEAR**

Fall		Spring	
AECO 236, Mkt. Ag. Prod.	3	AECO 324, Ag. Eco. Res. Meth.	2
CHEM 142, Gen. Chem.	4	ENG 233, Tech. Writing	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt. Funct.	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
*Other courses	3	*Other courses	6
<hr/>		<hr/>	
17-18		18-19	

THIRD YEAR

Fall		Spring	
AECO 339, Ag. Price Theory	3	AECO 341, Ag. Statistics	4
SPCH 338, Bus. and Prof. Spch. or		AECO 433, Prod. Ec.	3
SOC 331, Rural Soc.	3	*Other courses	10
*Other courses	12		
<hr/>		<hr/>	
18		17	

FOURTH YEAR

Fall		Spring	
AECO 430, Spec. Prob. in Ag. Eco.	3	AECO 411, Seminar	1
*Other courses	15	AECO 435, Ag. Policy & Org.	3
<hr/>		*Other courses	13
18		<hr/>	
		17	

Students must select one of the five areas of emphasis listed below. Required courses and electives (to be approved by the department) which satisfy the 136 hour minimum for graduation (exclusive of P.E., Band, or Basic ROTC) are indicated after each area of emphasis.

* **Agribusiness Emphasis:** ACCT 234 and 235; BLAW 338 and 339; MGT 331; FIN 333; AECO 333, 334, 432, 434, 436, 439, 4311, and 4315, plus 17 hours of electives, at least 6 of which are to be selected from 300 or 400 level courses taught in the School of Business Administration.

* **Farm Management Emphasis:** AECO 334, 335, 434, 437, 4311, and 4314; AGRO 241, 331, 341, 4311, and 4312; AG E 333; CHEM 341; plus 17 hours of electives, at least 6 of which are to be selected from 300 or 400 level courses in agricultural sciences.

* **Ranch Management Emphasis:** AECO 334, 335, 431, 437, 438 or 4314, and 4311; AGRO 341; A H 331, 432 and 436; CHEM 341; RMGT 331 and 333, plus 18 hours of electives, at least 6 of which are to be selected from 300 or 400 level courses in agricultural sciences.

* **Rural Socioeconomics Emphasis:** PSY 230 and 330; PHIL 230; SOC 230, 331, 438 and 4313; SPCH 338; FIN 333; AECO 333, 432, and 434, plus 26 hours of electives, at least 12 of which are to be selected from: SOC 334, 339, 432, 436, 437; PSY 436; PHIL 231, 336, 436; ECO 337, 339, 3311, 435; ODFR 433, 439; JOUR 233, 3312; or AECO 436, 4311 or 4313.

* **Agricultural Economics Research Emphasis:** ACCT 234 and 235; MATH 131 and 151; FIN 333; ECO 231 and 3311; AECO 432, 434, 439, 4312 and 4313, plus 21 hours of electives, 11 or more of which are to be selected from: MATH 152, 4314, 4324; ECO 331, 334, 336, 4311; JOUR 3312; or AECO 333, 431, 436, 4311, or 4315.

Courses in Agricultural Economics.**FOR UNDERGRADUATES**

235. **Fundamentals of Agricultural Economics (3:3:0).** Introduction to fundamental economic principles and their application to agricultural problems.
236. **Principles of Marketing Agricultural Products (3:3:0).** Prerequisite: AECO 235. Introduction to agricultural marketing, emphasizing applications of economic principles to marketing firms, functions, and problems.
324. **Agricultural Economics Research Methodology (2:2:0).** Prerequisite: AECO 236. Methods of research analysis and statistics in agricultural economics, including surveys, budgeting and synthesis, experimental design, tabulation, graphic correlation, and use of electronic computers.
325. **Farm Laws (2:2:0).** Prerequisite: AECO 236 or approval. Legal problems and practices affecting the farmer in his business.
333. **Cooperatives in Agriculture (3:3:0).** Prerequisite: AECO 236. Organization and operation of agricultural cooperatives.
334. **Farm Management (3:2:3).** Prerequisite: AECO 236 or approval. Organization and management of the individual farm. Field trips to nearby farms.
335. **Agricultural Records and Analysis (3:2:2).** Prerequisite: AECO 334 or approval. Methods and systems of recording and analyzing farm and ranch operational data; summarizing and using records as effective aids to improve farming and ranching. Laboratory practice in record keeping and analysis.
339. **Agricultural Price Theory (3:3:0).** Prerequisite: AECO 236 and junior standing or approval. Basic economic principles with applications to agricultural pricing problems.
341. **Agricultural Statistics (4:3:3).** Prerequisite: Junior standing and 3 hours of mathematics. Principles and procedures involved in the analysis of agricultural data including indices of central tendency and dispersion; probability; sampling; significance tests; and simple linear correlation.
411. **Seminar (1:1:0).** Prerequisite: Senior standing. Assigned readings, informal discussion, written and oral reports on subjects relating to agricultural economics.

FOR UNDERGRADUATES AND GRADUATES

430. **Special Problems in Agricultural Economics (3).** Prerequisite: AECO 324 and 339 or approval. Individual instruction and assigned research on a problem of interest to the students. May be repeated with approval of department chairman.

431. **Livestock Marketing (3:3:0).** Prerequisite: AEEO 236 and junior standing. Organizational structure and adjustments in the livestock-meat industry, emphasizing prices and pricing; grades and grading; regulatory programs; foreign trade; and futures trading.
432. **Statistical Methods in Agricultural Research (3:3:0).** Prerequisite: AEEO 341. Advanced agricultural statistical analysis related to research methods using probability theory; tests of statistical significance; multiple correlation and regression; analysis of variance and covariance; and experimental design.
433. **Production Economics (3:3:0).** Prerequisite: AEEO 339 or approval. Basic tools of economics used to analyze problems facing the farm business, emphasizing the decision-making process.
434. **Agricultural Marketing Economics (3:3:0).** Prerequisite: AEEO 339 or approval. Economic principles applied to marketing problems, emphasizing field crops, dairy and horticultural products; pricing, costs, market structure, marketing programs, and research procedures.
435. **Agricultural Policies and Organizations (3:3:0).** Prerequisite: Junior standing or approval. Historical development and economic analysis of public programs and policies affecting agriculture, emphasizing the role of farm organizations, economic effects of alternative programs, and current developments.
436. **Trade in Agricultural Products (3:3:0).** Prerequisite: Senior standing, AEEO 339, or approval. Economic principles of interregional and international trade, location, and inter-area competition in agricultural products.
437. **Farm and Ranch Appraisal (3:2:3).** Prerequisite: Senior standing or approval. Factors governing land prices and valuation. Appraisal of lands for use, sale, making loans, condemnation, settlement of estates, and taxation. Appraisal reports.
438. **Range and Ranch Economics (3:3:0).** Prerequisite: AEEO 235 and junior standing. Organization and management of ranch business, emphasizing resource and enterprise combinations, prices and marketing, ranch records, financing, appraisal, and range conservation. Short field trips.
439. **Agricultural Price Analysis (3:3:0).** Prerequisite: AEEO 341 and 339 or approval. Analysis of agricultural price variations, trends, cycles, seasonal variations, and statistical analysis of price changes.
4311. **Agricultural Finance (3:3:0).** Prerequisite: AEEO 236 and junior standing. Problems of financing agricultural needs, emphasizing capital and credit needs; cost of credit; sources of credit; payment methods; credit terms and risks. Analysis of private and public agricultural credit agencies.
4312. **Mathematical Economics and Econometrics for Agriculture (3:3:0).** Prerequisite: AEEO 339 and 341 or equivalents. Mathematical tools necessary for treatment of basic economic relationships involving prices and quantities, inputs and outputs, and costs and revenue. Formulation and analysis of economic models applicable to agriculture.
4313. **Agricultural Resource Economics (3:3:0).** Prerequisite: Junior standing or approval. Economics of agricultural resource allocation including land economics and economics of water development, allocation, and conservation.
4314. **Advanced Farm Management (3:2:3).** Prerequisite: AEEO 334 or approval. Advanced principles and practices of farm management; emphasizing purchasing and use of farm machinery and equipment; labor, feed, capital, water, fertilizer, and land; and farm planning procedures.
4315. **Agricultural Business Management (3:3:0).** Prerequisite: AEEO 434 or approval. Managerial techniques applied to decision making problems of agricultural business firms in the procurement, handling, storage, processing, and distribution of agricultural inputs and products.

FOR GRADUATES

511. **Seminar (1:1:0).** Current agricultural economic problems.
520. **Research Methodology in Agricultural Economics (2:2:0).** Prerequisite: Graduate standing. Advanced training in research methods and procedures including role and uses of theory, problem selection, development and testing of hypotheses.
531. **Advanced Production Economics (3:3:0).** Prerequisite: AEEO 433 and graduate standing. Criteria of resource efficiency; interindustry relationships; uncertainty and expectations; location and timing of production and technological changes.
532. **Agriculture and Public Policy (3:3:0).** Prerequisite: AEEO 435 or equivalent. Analysis and evaluation of policies and programs affecting agriculture. Includes price and income policies, regulatory and service programs, marketing agreements and orders, antitrust and foreign trade policies.
533. **Seminar in Agricultural Marketing (3:3:0).** Prerequisite: AEEO 434 or equivalent. Market structure analysis and public policy, interregional competition and regional economic development, economics of grading and marketing research.
534. **Research in Agricultural Economics (3).** A selected research problem in agricultural economics. May be repeated for credit upon approval.
535. **Contemporary Agricultural Economics (3:3:0).** Prerequisite: Graduate standing. Survey of the nature and development of basic economic principles and analytical economic research methods, with applications to agriculture. For nonmajors only.
536. **Agricultural Distribution Economics (3:3:0).** Prerequisite: AEEO 4315 or equivalent. Economic principles and quantitative analytical procedures applied to the marketing and distribution of agricultural products with emphasis on fundamental demand relationships, emphasizing storage and inventory control; transportation and intermarket distribution; grades and quality control; product differentiation and price discrimination; location of processing facilities; and marketing programs.
631. **Master's Thesis (3).** Enrollment required at least twice.

Department of Agricultural Education

This department supervises the following degree programs: AGRICULTURAL EDUCATION, *Bachelor of Science*, *Master of Science*, and *Master of Education*.

Degree requirements are given in the accompanying curriculum table. There are 136 hours required for graduation, exclusive of physical education, band, or basic ROTC.

Agricultural Education Curriculum.

FIRST YEAR
(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
ENG 233, Tech. Writing	3	HIST 231, Hist. of U.S. to 1877	3
AG E 220, Ag. Mech.—Woodwork	2	AG E 221, Ag. Mech.—Metalwork	2
CHEM 142, Gen. Chem.	4	CHEM 341, Intro. Org. Chem.	4
BIOL 142, Zoology	4	ENG 232, Mast. of Lit. or	
AECO 236, Mkt. Ag. Prod.	3	SPCH 338, Bus. & Prof. Spch.	3
P.E., Band, or Basic ROTC	1-2	ENTO 231, Intro. Ento.	3
		P.E., Band, or Basic ROTC	1-2
	17-18		16-17

THIRD YEAR

Fall		Spring	
AG E 333, Farm Tractors & Other Power Units	3	AG E 222, Ag. Surveying or	
AGRO 241, Soils	4	AG E 223, Farm Utilities	2
ED 332, Ed. Psych.	3	RMGT 331, Range Mgt. Prin.	3
A H 233, Intro. Poult. Husb.	3	AGRO 341, Fund. Prin. of Gen.	4
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt. Funct.	3
HIST 232, Hist. of U.S. since 1877	3	A H 331, Prin. of Nutrition	3
		Electives	3
	19		18

FOURTH YEAR*

Fall		Spring	
AECO 334, Farm Mgt. or		AGED 434, High School Meth.	3
AECO 438, Ranch Eco.	3	AGED 435, Supervised Farm & FFA	3
Anim. Husb., advanced courses	5	AGED 461, Student Tehg.	6
AGRO 4312, Crop Prod.	3	AG E 4311, Adv. Ag. Mech.	3
ED 4315, Audio-Visual Ed.	3	Electives	3
Electives	3		
	17		18

Hours required for graduation, exclusive of P.E., Band or Basic ROTC—136.

* First and second semesters of senior year are interchangeable. Approximately 50 percent of the senior students qualifying to teach vocational agriculture will take the agricultural education work the first semester, and the other 50 percent will take it the second semester.

Courses in Agricultural Education.**FOR UNDERGRADUATES**

111. **The Agricultural Industry (1:1:0).** Survey of the field of agriculture, vocational guidance. Required of all freshman students in the School of Agriculture.
430. **Agricultural Education Problems (3).** Prerequisite: senior standing and approval of department chairman. Individual investigation. May be repeated for credit.
432. **Methods in Adult Agricultural Education (3:2:2).**
461. **Student Teaching (6).** Prerequisite: Senior standing in agriculture. One-half of one semester of off-campus supervised student teaching in high school vocational department approved by the Agricultural Education Department.

FOR UNDERGRADUATES AND GRADUATES

434. **Methods of Teaching Vocational Agriculture in the High School (3:2:3).**
435. **Methods in Supervised Farming and Future Farmer Work (3:2:3).**

FOR GRADUATES

522. **Advanced Methods in High School Vocational Agriculture (2:2:0).**
523. **Advanced Methods in Adult Agricultural Education (2:2:0).**
524. **Advanced Methods in Future Farmer Work (2:2:0).**
531. **Investigation in the Field of Agricultural Education (3).** Investigation of a problem in the field of vocational agriculture of special interest to the student; presentation of a paper. May be repeated for credit.
532. **Research Methods in Agricultural Education (3:3:0).** Adoption of research techniques to problems in agricultural education. The selection of a research problem and determining the correct research design and treatment of the data.
535. **Problems (3).** Problems in the field of vocational agriculture of special interest to the individual student. May be repeated for credit.
536. **Advanced Methods of Teaching Farm Mechanics (3:3:0).** Organization, management, and equipping the farm shop; preparation and use of job sheets; practice in the demonstration of shop techniques; development of a farm mechanics course of study.
538. **Program Development in Agricultural and Extension Education (3:3:0).**
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required at least twice.

Department of Agricultural Engineering

This department administers the following degree programs: **AGRICULTURAL ENGINEERING** (jointly supervised by the schools of Agriculture and Engineering), *Bachelor of Science in Agricultural Engineering*, *Master of Science in Agricultural Engineering*; **MECHANIZED AGRICULTURE**, *Bachelor of Science*.

The Department of Agricultural Engineering is primarily concerned with the application of basic engineering principles to the conditions and require-

ments of agriculture as an industry, and as a field of applied science. This responsibility is discharged through teaching and research activities for service to agriculture and with the development and training of professional agricultural engineers and agriculture majors in mechanized agriculture. Appropriate course offerings and laboratory facilities are available in the areas of farm power and machinery, buildings and structures, electrification, processing, soil conservation, and water management.

Expanding agricultural mechanization, to produce needed food and fiber, has caused an increasing demand for agricultural engineering and mechanization graduates. Many graduates move rapidly into management positions. Employment is well distributed among business and industrial organizations, individual private enterprises, and government agencies.

Agricultural Engineering Curriculum.

FIRST YEAR*			
Fall		Spring	
AGED 111, The Ag. Indus.	1	AG E 122, Constr. Matl. & Fabr.	2
AGRO 131, Prin. of Agron.	3	A H 131, Anim. Science	3
ENG 131, Coll. Rhct.	3	ENG 132, Coll. Rhct.	3
EA&D 135, Engr. Anal.	3	E GR 136, Engr. Graphics	3
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	16-17		17-18
SECOND YEAR			
Fall		Spring	
AECO 235, Prin. of Ag. Eco.	3	AG E 233, Engr. Instr. & Contr.	3
AG E 232, Plane & Topo. Surv.	3	C E 233, Statics	3
CHEM 141, Gen. Chem.	4	CHEM 143, Gen. Chem.	4
MATH 235, Anal. Geom. & Calc. III	3	MATH 335, Math. for Engr. & Scits. I	3
PHYS 143, Prin. of Phys. I	4	PHYS 241, Prin. of Phys. II	4
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	18-19		18-19
THIRD YEAR			
Fall		Spring	
AG E 336, Prin. Ag. Mach. Des.	3	E E 234, Elect. Instr.	3
AGRO 241, Soils	4	C E 3311, Mech. of Solids	3
C E 332, Dynamics	3	C E 3351, Mech. of Fluids	3
E E 233, Elec. Sys. Anal.	3	GOVT 231, Amer. Govt., Org.	3
I E 321, Computer Prog.	2	M E 3321, Engr. Thermo. I	3
M E 3314, Mechanisms	3	Elective (Humanity)	3
	18		18
FOURTH YEAR			
Fall		Spring	
AG E 411, Seminar	1	AG E 433, Elem. of Tract. Des.	3
AG E 436, Ag. Proc. Sys.	3	AG E 434, Farm Elec. Sys.	3
AG E 438, Funct. Des. of Ag. Struct.	3	AG E 437, Des. Irrig. Sys.	3
AG E 442, Engr. Soil & Water Conser.	4	AG E 439, Struct. Des. Farm Bldg.	3
GOVT 232, Amer. Govt., Funct.	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3		
	17		18

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* See also Alternate Freshman Year, School of Engineering.

Mechanized Agriculture Curriculum.

FIRST YEAR*			
Fall		Spring	
AGED 111, The Ag. Ind.	1	AG E 112, Prin. of Ag. Mech.	1
AGRO 131, Fund. of Agron.	3	AG E 220, Ag. Mech. I	2
A H 131, Anim. Sci.	3	CHEM 141, Gen. Chem.	4
ENG 131, Coll. Rhct.	3	D I 131, Prin. Dairy & Food Indus.	3
HORT 131, Prin. of Hort.	3	ENG 132, Coll. Rhct.	3
MATH 133, Coll. Algebra	3	MATH 131, Coll. Trig.	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		17-18
SECOND YEAR			
Fall		Spring	
AG E 221, Ag. Mech. II	2	ACCT 231, Indus. Acct.	3
AECO 235, Fund. of Ag. Eco.	3	AG E 232, Plane & Topo. Surv.	3
CHEM 142, Gen. Chem.	4	HIST 231, Hist. of U.S. to 1877	3
ENG 233, Tech. Writing	3	MKT 332, Prin. of Mkt.	3
PHYS 141, Gen. Physics	4	PHYS 142, Gen. Physics	4
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		17-18

THIRD YEAR

Fall		Spring	
AGE 223, Farm Utilities	2	AGE 233, Instr. & Control	3
AGE 331, Ag. Machinery	3	AGE 333, Tractors & Power Units	3
AGRO 241, Soils	4	AGE 335, Irrig. & Eros. Control	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
HIST 232, Hist. of U.S. since 1877	3	MKT 339, Prin. of Salesmanship	3
MKT 334, Prin. of Advtg.	3	SPCH 338, Bus. & Prof. Spch.	3
	18		18

FOURTH YEAR

Fall		Spring	
AGE 332, Farm Elect. & Proc.	3	AGE 430, Ag. Engr. Prob.	3
AGE 411, Seminar	1	AGE 432, Farm Bldg & Environ.	3
AGE 435, Farm Mech. Prob.	3	JOUR 3312, Spec. Jour.	3
BLAW 338, Bus. Law	3	MKT 335, Prin. of Retailing	3
SECT 321, Office Mach.	2	Electives	6
Electives	6		18
	18		

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* If Uniform Freshman Year curriculum is followed, BIOL 141 may be substituted in this curriculum.

Courses in Agricultural Engineering.

FOR UNDERGRADUATES

111. **Fundamentals of Agricultural Engineering (1:1:2).** Fundamentals of agricultural engineering, including areas of specialization. May be used for degree credit with dean's approval.
112. **Principles of Agricultural Mechanization (1:1:0).** Development of agricultural mechanization, present concepts, and future role. The engineering design, service, and maintenance of farm equipment, structures, electrification, and conservation of resources.
122. **Construction Materials and Fabrication Methods (2:1:3).** Properties of materials and methods of on-farm construction of equipment and structures. Includes wood, concrete, and metal member fabrication.
220. **Agricultural Mechanics I—Woodwork (2:1:3).** Selection, use, and maintenance of hand tools and power woodworking equipment. The selection and estimation of materials and wood and concrete construction.
221. **Agricultural Mechanics II—Metalwork (2:1:3).** Hand and power tools for farm metal work. Includes welding and cold metal work for construction and repairs.
222. **Agricultural Surveying and Land Conservation (2:1:3).** Measurement of distances and areas, traversing, elevations, and mapping. Includes laying out terraces and ditches for water control.
223. **Farm and Home Utilities (2:1:2).** Domestic water supply and its distribution, including plumbing and waste disposal. Electrical wiring, heating, cooling, lighting, and ventilation of farm structures.
232. **Plane and Topographic Surveying (3:2:3).** Precision measurement of distances, areas, and elevations. Includes traversing, photogrammetry, plane table, transit, stadia, horizontal curves, topographic mapping, and construction layout.
233. **Engineering Instrumentation and Control Systems (3:2:2).** Basic engineering measurements and instrumentation for determining physical and environmental quantities of length, area, temperature, pressure, quantity, velocity, electricity, power, and atmosphere.
331. **Agricultural Production Machinery (3:2:2).** Agricultural crop production machinery; classification, operation, adjustment, and maintenance. Includes tillage, planting, cultivating, harvesting, and processing machinery.
332. **Farm Electrification and Processing (3:2:2).** Principles of electricity as related to agricultural applications. Basic theory, generation, storage, distribution, and uses on farmsteads and in processing systems.
333. **Farm Tractors and Other Power Units (3:2:2).** Principles of internal combustion engines and other power sources. Includes tractor drawbar applications and other power transmissions in agricultural production.
335. **Irrigation and Erosion Control (3:3:0).** Principles and practices of irrigation and water erosion control systems. Includes water movement, storage, quality, salinity, and use by plants.
336. **Principles of Agricultural Machinery Design (3:2:3).** Mechanical design and materials used for farm machinery construction. Includes materials, principles of design by type, capacity, maintenance, and effective use.

FOR UNDERGRADUATES AND GRADUATES

411. **Agricultural Engineering Seminar (1).** Assigned readings, oral and written reports, discussions, field trips, and lectures by visiting professional engineers.
430. **Agricultural Engineering Problems (3).** Individual investigation of a technical or design problem. Systematic research and a final report required.
432. **Farm Buildings and Environment Control (3:3:0).** Determining farm building requirements, materials, design, and construction. Includes framing, environment control methods, equipment, and necessary utilities.
433. **Elements of Farm Tractor Design (3:2:3).** Theory of internal combustion engines, thermodynamic principles, kinematics and dynamics of tractor power application; drawbar, power take-off, and traction mechanisms.
434. **Farm Electrification Systems (3:2:3).** Farm electric distribution systems; wiring, controls, motor application, refrigeration, heating, lighting, and ventilation. Special applications to the agricultural industry.
435. **Farm Mechanics Problems (3).** Individual study of an advanced phase of farm mechanization or farm mechanics. Research report required.
436. **Agricultural Processing Systems (3:2:3).** Engineering principles in agricultural product conveyance, processing, and storage. Includes materials handling, treatment, and packaging of fibers, feeds, and food.

437. **Design of Farm Irrigation Systems (3:2:3).** Design of gravity and sprinkler irrigation systems; including well drilling development, pumping, structures, conveyance, and efficiency control.
438. **Environment and Functional Design of Agricultural Structures (3:2:3).** Biological response of plants and animals to environment. Engineering analysis and design of environmental structures; including heating, cooling, lighting, ventilation, and humidity.
439. **Structural Design of Farm Buildings (3:2:3).** Structural design of farm buildings and estimation. Includes load and stress analysis, axial loading, columns, beams, connections, foundations, floors, framing, and roofs.
442. **Engineering for Soil and Water Conservation (4:3:3).** Engineering aspects and design of soil and water conservation structures; including terraces, diversions, drops, chutes, spillways, drainage systems, earthen dams, runoff determination.
4311. **Advanced Agricultural Mechanics (3:2:2).** Organization, equipment, and management of vocational agricultural shops. Advanced techniques in design and construction of projects. Emphasis on welding and fabrication.

FOR GRADUATES

511. **Seminar (1:1:0).** Classical development of the agricultural engineering profession and significant research. Oral presentations and organized discussion.
530. **Agricultural Engineering Research (3).** Advanced selected research problems in agricultural engineering. Laboratory experimentation and final report required.
531. **Investigations in Advanced Agricultural Mechanics (3).** Individual study or investigation of an advanced phase of agricultural mechanics. Emphasis placed on advanced mechanization technology.
532. **Instrumentation and Research Methods (3:3:0).** Principles, use, and limitation of instruments in measurement of physical quantities. Also research design, model study, analysis, and similitude.
533. **Advanced Theory of Farm Machinery Design (3:2:2).** Machine functional requirements, analysis of forces, loads, stress, materials, design, performance of series, testing of proto models, and manufacture.
534. **Theory of Agricultural Structures Design (3:3:0).** Theoretical approach to an analysis of structures applicable to agricultural enterprises. Materials and structural design for housing plants, animals, and produce.
535. **Design Theory of Earth Structures (3:3:0).** Design principles of earthen embankments; engineering soil classification, earth pressures, seepage, consolidation, settlement, slope stability, and landslides.
536. **Advanced Farm Electrification and Processing Systems (3:3:0).** Theory of electronic and mechanical controls for automated materials handling and processing systems related to agricultural plants and enterprises.
537. **Advanced Theory of Water Utilization (3:3:0).** Advanced study of surface and underground water resources and means of utilization for agricultural, domestic, and industrial purposes.
538. **Advanced Technical Problems in Agricultural Engineering (3).** Advanced technical problem of interest to the profession. Individual study, laboratory work, and final report required.
539. **Bioengineering—Environmental Control (3:3:0).** Bioengineering aspects of environmental research facilities. Analysis of plant and animal growth chambers; including restrained and unrestrained measurement of physiological functions.
631. **Master's Thesis (3).** Enrollment required at least twice.

Department of Agronomy and Range Management

This department supervises the following degree programs: *Bachelor of Science* in AGRONOMY—CROPS MAJOR, AGRONOMY—SOILS MAJOR, and in RANGE MANAGEMENT; *Master of Science* in CROP SCIENCE, SOIL SCIENCE, and RANGE SCIENCE.

The crops curriculum meets the standards suggested by the Crop Science Society of America, the soils curriculum those set by the Soil Science Society of America, and the range management program those set by the Range Management Education Council and the American Society of Range Management. All curricula meet the Civil Service standards for their respective professions.

Not more than one grade of D in agronomy courses, specifically required in an option, may be counted towards a degree in agronomy. Other agronomy courses selected, not specifically required in an option, may be counted towards the degree with the minimum passing grade. The curricula for the undergraduate programs appear in the tables below.

Crops Curriculum.

FIRST YEAR
(See Uniform Freshman Year)

SECOND YEAR		Spring	
Fall			
ENG 233, Tech. Writing	3	CHEM 341, Intro. Org. Chem.	4
AGRO 241, Soils	4	BIOL 142, Zoology	4
MBIO 231, Bacteriology	3	ENTO 231, Intro. Entom.	3
CHEM 142, Gen. Chem.	4	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	*Other courses	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2

THIRD YEAR

Fall		Spring	
AGRO 331, For. & Past. Crops.	3	AGRO 341, Fund. Prin. of Genetics	4
A. H. 331, Prin. of Nutr.	3	BOT 331, Plant. Physiol.	3
*Other courses	12	*Other courses	10
	18		17

FOURTH YEAR

Fall		Spring	
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
*Other courses	13	*Other courses	14
AGRO 410, Seminar	1		
	17		17

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136. All electives must be approved by department chairman.

* **Crop Sciences Emphasis:** In addition to the above courses, the student choosing to emphasize crop science must take the following courses: PHYS 141, 142; MATH 131, CHEM 342; BOT 332, 339, and AGRO 431, at least 6 hours from AGRO 332, 342, 425, 433, and 6 hours from AGRO 434, 435, 436, 439, 4311, 4314, and 16 hours of other electives approved by the department.

* **Crop Production Emphasis:** In addition to the above courses, the student choosing to emphasize crop production must take the following: AECCO 236; ENTO 321; BOT 332; AGRO 431, 4311; AG E 222 and 335, at least 15 hours from other agronomy courses, and 18 hours of other electives approved by the department.

* **Agronomic Industry Emphasis:** In addition to the above courses, the student choosing to emphasize agronomic industry must take the following courses: SPCH 338; AECCO 236, 339, 4311, at least 12 hours in AGRO, and at least 15 hours from the following courses: ACCT 234, 235; FIN 231, 335; MGT 331, 339; MKT 334, 339; BLAW 338, 339, and 13 hours of other electives approved by the department.

Soils Curriculum.**FIRST YEAR**

(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
AGRO 241, Soils	4	MBIO 231, Bacteriology	3
CHEM 142, Gen. Chem.	4	CHEM 341, Intro. Org. Chem.	4
GEOL 143, Phys. Geol.	4	*GEOL 144, Hist. of Geol.	4
BIOL 142, Zoology	4	**MATH 151, Anal. Geom. & Calc. I	5
P.E., Band or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		17-18

THIRD YEAR

Fall		Spring	
CHEM 251, Anal. Chem.	5	BOT 331, Plant Physiol.	3
**MATH 152, Anal. Geom. & Calc. II	5	AGRO 341, Fund. Prin. of Genetics	4
PHYS 141, Gen. Phys.	4	Chemistry electives	3
AGRO 435, Soil Class.	3	PHYS 142, Gen. Physics	4
	17	***Electives	3
			17

FOURTH YEAR

Fall		Spring	
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt. Func.	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
AGRO 439, Soil Mbio.	3	AGRO 436, Soil Chem.	3
AGRO 4314, Soil Physics	3	AGRO 410, Seminar	1
***Electives	4	***Electives	8
ENG 233, Tech. Writing	3		
	19		18

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136. All electives must be approved by department chairman.

* BIOL 333, or AG E 232 may be taken in place of GEOL 144.

** For students with inadequate mathematics background as demonstrated by the placement test scores, MATH 1315 or MATH 131 and 133 may be taken along with MATH 151 to satisfy the mathematics requirement.

*** Two courses from the following must be elected: AGRO 331, 342, 431, 433, 4313, 4315, 4316; RMGT 333, 337. One course from the following must be elected: AGRO 434, 4311.

Range Management Curriculum.**FIRST YEAR**

(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
AGRO 241, Soils	4	RMGT 333, Range Plants	3
CHEM 142, Gen. Chem.	4	BOT 334, Taxonomy	3
RMGT 231, Intro. Wildlife	3	CHEM 341, Intro. Org. Chem.	4
P.E., Band, or Basic ROTC	1-2	ENG 233, Tech. Writing	3
*Other courses	6	P.E., Band, or Basic ROTC	1-2
	18-19	*Other courses	3
			17-18

THIRD YEAR

Fall		Spring	
A H 331, Prin. of Nutr.	3	BOT 331, Plant Physiol.	3
GOVT 231, Amer. Govt., Org.	3	RMGT 332, Range Ecology	3
HIST 231, Hist. of U.S. to 1877	3	GOVT 232, Amer. Govt., Funct.	3
RMGT 337, Prin. of Range Mgt.	3	HIST 232, Hist. of U.S. since 1877	3
*Other courses	6	*Other courses	6
	18		18

FOURTH YEAR

Fall		Spring	
RMGT 435, Range Improv. Pract.	3	RMGT 438, Range Anal. & Plan.	3
RMGT 410, Range Seminar	1	*Other courses	14
*Other courses	13		17
	17		

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

*** Range Management Emphasis:** In addition to the above courses, the student selecting the Range Management Emphasis must take the following courses for the sophomore year: BIOL 142; MATH 131; AG E 222. For junior year, AGRO 331, 341, 435; BIOL 333; SPCH 338. For senior year: AECC 438; A H 431, 441; RMGT 432, and at least one advanced course from AGRO 434, 436, 439, 4311, 4314; RMGT 431 or 434, and sufficient elective hours to make a total of 136 hours, exclusive of P.E., Band, or Basic ROTC.

*** Wildlife Emphasis:** In addition to the above courses, the student choosing the Wildlife Emphasis must take the following courses which meet the Wildlife Society's professional training standards: BIOL 142, 333; MATH 131; ENTO 231; ZOOL 241, 333, 337, 437; A H 336, 337; AECC 341; RMGT 430 and choice of RMGT 431, 433 or 434, and sufficient electives to provide a minimum of 136 hours, exclusive of P.E., Band, or Basic ROTC.

*** Range Business Emphasis:** Students desiring additional background for the business phases of range management can select courses in agricultural economics, finance, accounting, business law, marketing, and similar areas to provide the needed academic information. The selection of such courses must be made with consultation and approval of the departmental staff. Substitutions in the Range Management Emphasis may be considered where sufficient need is demonstrated by the individual student to permit the completion of courses necessary for emphasizing the business aspects of range management.

Courses in Agronomy.

FOR UNDERGRADUATES

131. **The Fundamentals of Agronomy (3:2:2).** A survey course. Crops, their classification, adaptation, identification, production, and use. Elementary soils.
241. **Soils (4:3:2).** Prerequisite: CHEM 141, 142, or concurrent enrollment in CHEM 142. Formation and classification; physical, chemical, and biological properties; physical and chemical analysis and mapping of designated areas in laboratory.
331. **Forage and Pasture Crops (3:2:2).** Prerequisite: AGRO 131, junior standing in agriculture. The production and utilization of forage and pasture crops.
332. **Grain Crops (3:3:0).** Prerequisite: AGRO 131. The production, improvement, storage, and use of grain crops.
341. **Fundamental Principles of Genetics (4:3:2).** Prerequisite: Junior standing in agriculture or approval of instructor. Heredity and variation. The chromosome theory in plants and animals. Biometry as applied to genetic data.
342. **Crop Identification and Grain Grading (4:0:8).** Prerequisite: Sophomore standing in agriculture or approval of instructor. Identification of selected field crops, diseases, and weed plants and seeds; commercial grain grading.
410. **Seminar (1).** Prerequisite: Senior standing or approval of instructor. Assigned readings, current advances. Informal discussions, oral reports, and papers. May be repeated.
4312. **Crop Production (3:2:3).** Prerequisite: AGRO 131, 241, and junior standing in agriculture. Not open to agronomy majors. Applied production of fiber, grain, and forage crops. Seed and feed production. Emphasis on needs of vocational agriculture teachers, county agents, etc.

FOR UNDERGRADUATES AND GRADUATES

425. **Seed Technology (2:1:2).** Prerequisite: Senior standing in agriculture or approval of instructor. Analysis of planting seed, germination, and purity. Production, processing, storing, and marketing pure seed. Emphasis on registered and certified seed; study of state and federal seed laws.
430. **Agronomy Problems (3).** Prerequisite: Approval of instructor. An assigned problem and individual instruction. May be repeated for credit with approval of department chairman.
431. **Fundamental Principles of Plant Breeding (3:3:0).** Prerequisite: AGRO 341. Practical application of genetics in the breeding and improvement of plants.
433. **Cotton Production and Improvement (3:3:0).** Prerequisite: Junior standing in agriculture or approval of instructor. Culture, improvement, and classification of cotton. Disease and insect pests of cotton.
434. **Soil Conservation and Land Use Planning (3:2:3).** Prerequisite: AGRO 241, junior standing. Types of erosion, causes, and controls. Inspection trips in soil conservation, land use planning, and conservation management.
435. **Soil Classification (3:2:3).** Prerequisite: AGRO 241 or approval of instructor. Systems of classification and the relationships of world soils to different systems. Field trips to study selected soils.
436. **Soil Chemistry (3:2:3).** Prerequisite: AGRO 241, 12 hours of chemistry or approval of instructor for nonagriculture majors. Chemical composition of soils with emphasis on clays. Ion exchange phenomena. Chemical equilibria. Clay-organic reactions.
439. **Soil Microbiology (3:2:3).** Prerequisite: Junior standing and instructor's approval. Soil microorganisms, their occurrence, characteristics, and functions in the decomposition of organic matter and soil fertility.
4311. **Soil Fertility (3:2:3).** Prerequisite: AGRO 241. Nutrient availability as influenced by chemical, physical, and biological properties of soils. Fertilizer use. Field trips.

4313. **Weeds and Weed Control (3:2:2).** Prerequisite: CHEM 341. The importance, distribution, reproduction, and dissemination of weeds. Mechanical, biological, and chemical methods of control.
4314. **Soil Physics (3:2:3).** Prerequisite: AGRO 241, 6 hours each of physics and mathematics or approval of instructor. Physical properties of soils: structure, water, air, and temperature.
4315. **Nutrition of Crop Plants (3:3:0).** Prerequisite: BOT 331, CHEM 341, AGRO 241, or approval of instructor. The absorption, translocation, accumulation, re-export, essentiality, and function of the macro- and micro-nutrients. Interactions among the various nutrients.
4316. **Agricultural Plant Physiology (3:3:0).** Prerequisite: BOT 331, or approval of instructor, CHEM 342 recommended. Considerations in plant chemistry, membranes, respiration, and physiological aspects of radiant energy and water. Quantitative aspects, measurements, and current literature.

FOR GRADUATES

511. **Seminar (1:1:0).** Prerequisite: Approval of the instructor. Current literature in the field. May be repeated for credit on approval of major professor.
532. **Experimental Design and Analysis (3:2:2).** Prerequisite: Approval of instructor. Definition, description, and evaluation of the principal experimental designs and methods of analysis.
533. **Pedology (3:3:0).** Prerequisite: Approval of instructor. Processes of rock weathering with associated soil formation. Genesis of clay minerals. Soil forming factors and their inter-relationships.
534. **Research (3).** Prerequisite: Approval of major professor. A specific problem in line with the major interest of the student. May be repeated for credit upon approval of major professor.
536. **Soil and Plant Relationships (3:3:0).** Prerequisite: Approval of instructor. Selected topics in soil-plant relationships. Cause and effect, management, and control of factors influencing plant growth in the soil.
537. **Methods in Plant Breeding (3:3:0).** Prerequisite: Approval of instructor. Methods applicable to improving self- and cross-pollinated plants. Inbreeding, selection, hybridization, heterosis, quantitative inheritance, induced mutation, and ploidy.
631. **Master's Thesis (3).** Enrollment required at least twice.

Courses in Range Management.

FOR UNDERGRADUATES

231. **Introductory Wildlife (3:3:0).** Prerequisite: Sophomore standing. Introduction to the ecology and management of wildlife populations. Stresses principles, life histories, and management techniques.
232. **The Ecology of Natural Resource Conservation (3:3:0).** Prerequisite: Sophomore standing. An introduction to the conservation of renewable natural resources of native lands, including their multiple use for timber, water, range, recreation, and wildlife.
331. **Range Management Principles & Practices (3:2:3).** Prerequisite: Sophomore standing. A study of the native forage plants of the U.S.; their identification, distribution, ecology, and economic value.
332. **Range Ecology (3:2:3).** Prerequisite: BOT 334, AGRO 241, and RMGT 333. Successional patterns and descriptions of vegetation in grassland, forest, and desert communities of the western U.S. Manipulation of these communities with livestock and game. Field trips required.
333. **Range Plants (3:2:3).** 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.
337. **Principles of Range Management (3:2:3).** Prerequisite: RMGT 333. Application of ecological principles in the management of rangelands for sustained livestock products consistent with conservation of the range resource. Field trips required.
410. **Seminar (1).** Prerequisite: Senior standing. An organized discussion of current problems and research in range management. May be repeated.

FOR UNDERGRADUATES AND GRADUATES

430. **Wildlife Problems (3).** Prerequisite: Approval of instructor. Individual investigation of an assigned problem in wildlife management. Emphasis placed on the theory, methods, and practice of wildlife field work.
431. **Game Management (3:2:3).** Prerequisite: BIOL 142, RMGT 231, 3 hours of range management. A study of production, harvest, and maintenance of wildlife populations. Emphasis on big game species and their management. Field trips required.
432. **Range Management Problems (3).** Prerequisite: Departmental approval. Individual study and research in range or ranch management problems. May be repeated.
433. **Waterfowl and Wetland Ecology (3:2:3).** Prerequisite: RMGT 231, BOT 334, or approval of instructor. Ecology and management of continental waterfowl resources. Life histories, population management, and habitat manipulation are stressed. Field trips required.
434. **Upland Game Ecology (3:2:3).** Prerequisite: RMGT 231, or approval of instructor. Ecological approach to the management of upland game populations. Stresses population mechanisms and habitat management of selected species. Field trips required.
435. **Range Improvement Practices (3:2:3).** Prerequisite: RMGT 337. Principles and economics of grazing management, noxious plant control, revegetation, fertilization, and soil and water conservation practices on ranch lands. Field trips required.
438. **Range Analysis and Planning (3:2:3).** Prerequisite: RMGT 332, 337, and 435. A study of range analysis techniques and ranch management planning, including a practical exercise in planning the management of a ranch. Field trips required.

FOR GRADUATES

510. **Range Seminar (1).** Prerequisite: Departmental approval. An organized discussion of current problems in range management. May be repeated.
511. **Wildlife Seminar (1).** Prerequisite: Approval of instructor. Discussion of current wildlife problems, research and management. May be repeated for credit.
521. **Contemporary Resource Use (2:2:0).** Prerequisite: Approval of instructor. A study of related disciplines in agricultural science. Emphasizes the integration of all agricultural

research toward the solution of ecological problems caused by changing resource use patterns.

523. **Range Research Methods (2)**. Prerequisite: A H 536, AGRO 532 or approval of instructor. Methods and techniques for measuring range vegetation. Methods of analysis and presenting data. Application of experimental designs to range problems.
531. **Synecology (3:3:0)**. Prerequisite: RMGT 332 or equivalent. An advanced study of the range eco-system, causes and patterns of community development; coactions of plants and animals; and dynamics of succession and community change. Field trips required.
532. **Vegetation Influences (3:3:0)**. Prerequisite: Departmental approval. A study of the influence of plants on their organic and inorganic environments; and the effects of vegetation manipulation on soils, micro-climate, erosion, and water yields.
534. **Range Research (3)**. Prerequisite: Departmental approval. Individual study and research in range-related problems.
535. **Wildlife Research (3)**. Prerequisite: Approval of instructor. Individual study and research in wildlife-related problems. May be repeated for credit.
536. **Ecology of Arid Lands (3:3:0)**. Prerequisite: Approval of instructor. A study of the unique ecological features of arid lands, including plant and animal adaptations.
631. **Masters Thesis (3)**. Enrollment required at least twice.

Department of Animal Husbandry

This department supervises the following degree programs: *Bachelor of Science* in ANIMAL BUSINESS, ANIMAL PRODUCTION, or ANIMAL SCIENCE and *Master of Science* in ANIMAL BREEDING, ANIMAL NUTRITION, or MEAT SCIENCE. The Department of Animal Husbandry also directs the program in PREVETERINARY MEDICINE. Degree requirements are given in the accompanying curriculum tables.

Animal Business Curriculum.

FIRST YEAR
(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
ACCT 234, El. Acct. I	3	ACCT 235, El. Acct. II	3
AECO 236, Prin. Mkt. Ag. Prod.	3	A H 332, Anat. of Farm Anim.	3
A H 232, Meat & Meat Prod.	3	BIOL 142, Zoology	4
CHEM 142, Gen. Chem.	4	ENG 233, Tech. Writing	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		17-18

THIRD YEAR

Fall		Spring	
AGRO 341, Fund. Prin. of Genetics	4	A H 331, Prin. of Nutrition	3
BLAW 338, Bus. Law I	3	A H 332, Animal Genetics	3
CHEM 341, Intro. Org. Chem.	4	A H 336, Physiol. of Farm Anim.	3
GOVT 231, Amer. Govt., Org.	3	A H 338, Meat Proc. & Meat Mdse.	3
SPCH 338, Bus. & Prof. Spch.	3	BLAW 339, Bus. Law II	3
	17	GOVT 232, Amer. Govt., Funct.	3
			18

FOURTH YEAR

Fall		Spring	
A H 411, Anim. Sci. Seminar	1	A H 431, Range Cattle Prod.	3
A H 436, Anim. Nutrition	3	A H 432, Swine Prod.	3
A H 441, Sheep, Wool, & Mohair Prod.	4	*Other courses	12-13
*Other Courses	10-11		18-19
	18-19		

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* In addition to the above courses, the student wishing to major in animal business must take the following courses: A total of 15 hours chosen within one of the areas of (A) Data Programming: A H 422; ACCT 121, 232, 233, 246; AECO 341; I E 321; MATH 131, 151, 152, 238; (B) Land: ACCT 323, 331; AECO 334, 335, 437, 438, 4313; BLAW 331, 3313; FIN 231, 432, 439; MGT 330, 331; and (C) Marketing: ACCT 331; AECO 325, 333, 339, 431, 434, 436; FIN 231, 333; MGT 330, 331; MKT 332, 334, 335, 339, 439. A total of 7 hours of electives subject to the approval of the department chairman.

Animal Production Curriculum.

FIRST YEAR
(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
AECO 236, Prin. Mkt. Ag. Prod.	3	AGRO 241, Soils	4
A H 232, Meat & Meat Prod.	3	A H 333, Anat. of Farm Anim.	3
CHEM 142, Gen. Chem.	4	BIOL 142, Zoology	4
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		18-19

THIRD YEAR

Fall		Spring	
A H 321, Lvstk. & Meat Eval.	2	A H 331, Prin. of Nutr.	3
A H 336, Physiol. of Farm Anim.	3	A H 332, Anim. Genetics	3
AGRO 341, Fund. Prin. of Genetics	4	A H 337, Anim. San. & Disease Contr.	3
CHEM 341, Intro. Org. Chem.	4	MBIO 231, Bacteriology or	
ENG 233, Tech. Writing	3	ENTO 231, Intro. Entom.	3
*Other courses	2-3	RMGT 331, Range Mgt. Prin. & Pract.	3
		SPCH 338, Bus. & Prof. Spch.	3
	17-18		18

FOURTH YEAR

Fall		Spring	
A H 411, Anim. Sci. Seminar	1	*Other courses	16-17
A H 436, Anim. Nutrition	3		16-17
*Other courses	12-13		
	16-17		

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* In addition to the above courses, the student wishing to pursue an animal production major must complete the following three groups: (A) 8 hours of electives, approved by department chairman, (B) 6-7 hours chosen from A H 431, 4312, 435, and 441, (C) 17-18 hours chosen from the remaining courses in the preceding group and those within one of the following two areas: (1) Livestock: A H 233, 335, 338, 4311, 4313, 4314, 422, 430, 434, 438, 439; AG E 221, 222, 223; AECO 334, 431 or (2) Range: RMGT 231, 332, 333, 337, 435; BOT 334; AECO 334, 438; AG E 222, subject to the approval of the department chairman.

Animal Science Curriculum.**FIRST YEAR**

(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
A H 232, Meat & Meat Prod.	3	AGRO 241, Soils	4
CHEM 142, Gen. Chem.	4	A H 333, Anat. of Farm Anim.	3
ENG 233, Tech. Writing	3	BIOL 142, Zoology	4
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
MATH 131, Trig.	3	SPCH 338, Bus. & Prof. Spch.	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		18-19

THIRD YEAR

Fall		Spring	
AGRO 341, Fund. Prin. of Genetics	4	A H 331, Prin. of Nutrition	3
A H 336, Physiol. of Farm Anim.	3	A H 332, Anim. Genetics	3
CHEM 341, Intro. Org. Chem.	4	CHEM 342, Intro. Physiol. Chem.	4
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
*Other courses	3-4	*Other courses	3-4
	17-18		16-17

FOURTH YEAR

Fall		Spring	
A H 411, Anim. Sci. Seminar	1	*Other courses	17-18
A H 436, Anim. Nutrition	3		17-18
*Other courses	13-14		
	17-18		

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* In addition to the above courses, the student wishing to prepare for advanced studies must complete the following three groups: (A) 8 hours of electives approved by the department chairman; (B) 12-15 hours chosen from A H 337, 430, 431, 438, 439, 441, 4312, 4313, Prevett students may include A H 4313; (C) 16-19 hours chosen from BIOL 431; CHEM 241, 242; MATH 151, 152, 238; MBIO 231, 334, 430; PHYS 141, 142; ZOOL 241, 331, 332, 333, 435, 438, subject to the approval of the department chairman.

Preveterinary Medicine Curriculum.

This curriculum is designed to qualify students for entrance to schools of veterinary medicine. Texas Technological College offers only the two-year preveterinary medicine curriculum. 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 School of Agriculture.

FIRST YEAR

Fall		Spring	
AGED 111, The Ag. Indus.	1	BIOL 142, Zoology	4
A H 131, Gen. Anim. Sci.	3	CHEM 142, Gen. Chem.	4
BIOL 141, Botany	4	D I 131, Prin. of Dairy Indus.	3
CHEM 141, Gen. Chem.	4	ENG 132, Coll. Rhet.	3
ENG 131, Coll. Rhet.	3	MATH 131, Trig.	3
MATH 133, Coll. Algebra	3	P.E., Band, or Basic ROTC	1-2
P.E., Band, or Basic ROTC	1		18-19
	19		

SECOND YEAR

Fall		Spring	
CHEM 335, Org. Chem.	3	CHEM 336, Org. Chem.	3
CHEM 325, Org. Chem. Lab.	2	CHEM 326, Org. Chem. Lab.	2
ENG 233, Tech. Writing	3	ENG 231, Mast. of Lit.	3
PHYS 141, Gen. Phys.	4	A H 233, Intro. Poult. Husb.	3
P.E., Band, or Basic ROTC	1-2	PHYS 142, Gen. Phys.	4
		P.E., Band, or Basic ROTC	1-2
	13-14		16-17

In addition to the above, 6 hours of American history and 6 hours of government must be completed to meet state requirements. Hours required for completion of this curriculum, exclusive of P.E., Band, or Basic ROTC—74.

Courses in Animal Husbandry.

FOR UNDERGRADUATES

131. **General Animal Science (3:2:2).** An introductory course designed to orient the student in the modern field of animal agriculture. Emphasis on problems of breeding, feeding, management, and marketing.
232. **Meat and Meat Products (3:2:3).** Slaughtering, processing, and preservation techniques; anatomy and nomenclature; the meat packing industry; sanitation practices; and grading of meat and meat products.
233. **Introductory Poultry Husbandry (3:3:0).** Introduction to the poultry industry. Application of those factors concerned with economic production. Performance tests. Selecting, culling, housing, grading, caponizing, and artificial insemination.
321. **Livestock and Meat Evaluation (2:0:6).** Prerequisite: A H 131, A H 232. Comparative evaluation of breeding and market animals; carcass evaluation, selection and grading. Field trips to herds, plants, shows, and contests. May be repeated once for credit.
331. **Principles of Nutrition (3:3:0).** Prerequisite: CHEM 341. Digestibility and energy value of feeds. Feeding standards and calculation of rations for maintenance, growth, fattening, and for milk, wool, and egg production.
332. **Animal Genetics (3:3:0).** Prerequisite: AGRO 341. Genetics applied to the improvement of farm animals. Systems of breeding and selection. Systems of mating, such as inbreeding, outcrossing, and crossbreeding.
333. **Anatomy of Farm Animals (3:3:0).** Introduction to comparative anatomy of domestic animals.
335. **Artificial Breeding Systems (3:2:3).** Prerequisite: A H 333. The collection, evaluation, and storage of semen. Insemination techniques in cattle, sheep, swine, and poultry.
336. **Physiology of Farm Animals (3:3:0).** Prerequisite: A H 333. Introduction to physiology of domestic animals.
337. **Animal Sanitation and Disease Control (3:3:0).** Prerequisite: A H 336. Diseases of farm animals, both infectious and noninfectious, parasites, parasitic diseases, and the establishment of immunity through the use of biological products.
338. **Meat Processing and Merchandising (3:2:3).** Prerequisite: A H 232. The processing and manufacturing of meat food items. Merchandising practices and techniques as they affect carcass value. Sanitation control. Field trips to packing plants and retail stores.
411. **Animal Science Seminar (1:1:0).** Assigned subjects. Review of recent investigations. Reports and discussions. May be repeated once for credit.
430. **Special Problems in Animal Science (3).** Prerequisite: Senior standing and approval of department chairman. Individual investigation. May be repeated for credit.
434. **Horse Production (3:3:0).** Prerequisite: Approval of instructor. Breeding, feeding, breaking, training, stabling, and shoeing. Gaits. Care of stallions, brood mares, and foals. Parasites and diseases.

FOR UNDERGRADUATES AND GRADUATES

422. **Livestock Record Systems (2:2:0).** Prerequisite: A H 332. Principles of performance testing and records involved in such testing. Analysis and interpretation of actual records is a major part of the work.
431. **Range Cattle Production (3:3:0).** Prerequisite: A H 331, 332. Production and marketing of beef cattle. Analysis of production systems. Coordination of breeding, nutrition, management, and marketing. Inspection trips to ranches.
4311. **Beef Cattle Feedlot Management (3:2:3).** Prerequisite: A H 331. An advanced course dealing with the operation of industrial feedlots. Design of lots, economics, technical nutrition, cattle management, marketing, and consumer relations. Laboratory will be in-service, with visits to major operations in the area.
4312. **Swine Production (3:2:2).** Prerequisite: A H 331, 332. The swine industry. Breeding, feeding, housing, and marketing. Herd records. Diseases, parasites, and sanitation. Laboratory practice with farm animals and equipment is done as assigned problems.
4313. **Swine Management Systems (3:3:0).** Prerequisite: A H 4312. Factors affecting and interrelationships of capital, feed, labor, buildings, equipment, and other items in swine production.
4314. **Poultry Production (3:3:0).** Prerequisite: A H 233, 331. Breeding, feeding, management, and marketing of poultry and poultry products. Housing types as influenced by biological and engineering requirements. Egg and meat performance tests. Disease control and sanitation.
435. **Dairy Cattle Management (3:3:0).** Prerequisite: A H 331, 332. Feeding for growth, maintenance, and milk production. Handling and marketing milk and animals. Dairy barn construction and sanitation. Advanced registry and herd records.
436. **Animal Nutrition (3:3:0).** Prerequisite: A H 331. The role of nutrients in the metabolism of farm animals. Nutrient utilization and energy efficiency in production.
438. **Developmental Growth and Fattening (3:3:0).** A study of differentiation, development, growth, and fattening of domestic animals as influenced by hereditary and environmental interactions, and the interrelationships of growth and fattening with the physical and chemical composition of the body.
439. **Endocrinology (3:3:0).** Prerequisite: A H 333. A study of the endocrine glands and their secretions. The role of hormones in livestock production, including their influence upon metabolism, dietary requirements, growth, reproduction, lactation, and fattening.

441. **Sheep, Wool, and Mohair Production (4:3:2).** Prerequisite: A H 331, 332. Range and farm sheep. Angora goats. Breeding, feeding, disease, and parasite control. Wool and mohair production, grading, sorting, and marketing.

FOR GRADUATES

511. **Seminar (1:1:0).** Analysis of current and significant past research. Oral presentations and discussions. Enrollment in each semester while in graduate school.
532. **Environmental Physiology of Domestic Animals (3:3:0).** The study of animal-environment relationships with particular emphasis upon animal acclimatization to environmental conditions encountered in arid and semiarid land areas.
533. **Techniques in Animal Research (3).** Techniques currently employed in animal research. Inservice training in the use and application of these techniques.
534. **Research in Animal Science (3).** Inservice research work in breeding, nutrition, or meats. Problems are done on a semi-independent basis. Design and carrying out of actual experiments, including publication of results. May be repeated for credit.
536. **Biometry (3:2:2).** Analysis of experimental procedures and designs for agricultural research. Analysis of variance, and least-squares analysis. Component of variance partitioning. Regression and correlation techniques.
537. **Advanced Animal Breeding (3:3:0).** Population parameters. Heritability and heterosis. Genetic-environmental interactions. Methods for deriving population statistics. Genetic bases for performance testing programs.
538. **Animal Nutrition I—Ruminant (3:3:0).** Analysis of nutritional theory. Intermediary metabolism of nitrogen, energy, vitamins, and minerals under the conditions of maintenance and various types of production. Ruminant fermentation.
5311. **Animal Nutrition II—Monogastric (3:3:0).** Analysis of monogastric nutritional theory. Utilization of nutrients in various body processes. Effects of environment. Research procedures.
539. **Physiology of Reproduction (3:2:2).** Anatomy of reproductive systems; physiological regulations of reproductive processes; estrous cycle; gonadal functions; semen evaluation; fertilization; embryology; pregnancy; parturition; lactation; factors affecting reproductive efficiency; research techniques.
541. **The Science of Meat and Meat Products (4:3:3).** The application of various scientific disciplines in the study of meat and meat products. Histological, chemical, and biological properties of meat. Palatability characteristics, nutritive value, and quality factors. Preservation and packaging. Methods of analysis.
631. **Master's Thesis (3).** Enrollment required at least twice.

Department of Dairy Industry

This department supervises the following degree programs: DAIRY INDUSTRY, *Bachelor of Science* and *Master of Science*. Degree requirements are given in the accompanying curriculum table.

The department maintains a dairy plant with modern equipment for laboratory instruction in all phases of the dairy industry and for bacteriological and chemical analyses of food and dairy products.

Dairy Industry Curriculum.

FIRST YEAR

(See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
MBIO 231, Bacteriology	3	AEEO 236 Mkt. Ag. Prod.	3
CHEM 142, Gen. Chem.	4	CHEM 341, Intro. Org. Chem.	4
D I 241, Adv. Prin. Food & Dairy Indus. I	4	D I 231, Adv. Prin. Food & Dairy Indus. II	3
P.E., Band, or Basic ROTC Electives	1-2	ENG 233, Tech. Writing	3
	6	P.E., Band, or Basic ROTC Electives	1-2
	18-19		4
			18-19

THIRD YEAR

Fall		Spring	
ACCT 234, Elem. Acct. I	3	D I 314, Adv. Dairy Prod. Judging	1
D I 313, Dairy Prod. Judging	1	D I 322, Mkt. Dairy Prod.	2
D I 334, Fund. Food & Dairy Sci.	3	D I 335, Fund. Food & Dairy Sci. II	3
D I 337, Food Plant Equip. I	3	D I 338, Food Plant Equip. II	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
SPCH 338, Bus. & Prof. Spch.	3	Electives	6
Electives	3		
	19		18

FOURTH YEAR

Fall		Spring	
D I 437, Food Plant Mgt. & Mdse.	3	D I 411, Food & Dairy Ind. Seminar	1
D I 441, Dairy Prod. Mfg.	4	D I 433, Mkt. Milk	3
HIST 231, Hist. of U.S. to 1877	3	D I 435, Food & Dairy Insp. & Qual. Contr.	3
Electives	6	HIST 232, Hist. of U.S. since 1877	3
	16	Electives	6

16

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

Courses in Dairy Industry.**FOR UNDERGRADUATES**

131. **Principles of the Dairy and Food Industries (3:3:0).** A general survey of the dairy and food industries, food production, spoilage, preservation, and processing.
231. **Advanced Principles of Food and Dairy Industry II. (3:1:4).** Prerequisite: D I 131. Elementary training associated with bacteriological problems in the food and dairy industry.
241. **Advanced Principles of Food and Dairy Industry I (4:3:3).** Prerequisite: D I 131. A survey of methods and techniques involved in the processing and laboratory control of food and dairy products.
313. **Dairy Products Judging (1:0:3).** Prerequisite: Consent of instructor. Commercial grades and classification of dairy products; practice in judging milk, butter, cheese, and ice cream.
314. **Advanced Dairy Products Judging (1:0:3).** Prerequisite: Consent of instructor. Commercial grades and classification of dairy products; practice in judging milk, butter, cheese, and ice cream.
322. **Marketing Dairy Products (2:2:0).** Prerequisite: D I 131 or approval of instructor. Federal marketing orders, byproducts markets, pricing formula, brokerage policies.
334. **Fundamentals of Food and Dairy Science I (3:2:3).** Prerequisite: D I 131, CHEM 142 or consent of instructor. Chemical and physical principles of basic importance in the processing of dairy and food products.
335. **Fundamentals of Food and Dairy Science II (3:2:3).** Prerequisite: D I 334 or consent of instructor. Chemical and physical principles of basic importance in the processing of dairy and food products.
337. **Food Plant Equipment I (3:2:2).** Prerequisite: D I 131 or consent of instructor. Application of physical principles of heat and power to operation of food plant equipment; refrigeration; water problems; plumbing, sewage disposal; steam boilers.
338. **Food Plant Equipment II (3:2:2).** Prerequisite: D I 337 or consent of instructor. Principles involved in the selection, installation, and care of food plant equipment.

FOR UNDERGRADUATES AND GRADUATES

411. **Food and Dairy Industry Seminar (1:1:0).** Prerequisite: Senior standing in the department. Review of scientific literature; papers and reports; class discussion. Graduate students may repeat for credit.
430. **Food and Dairy Industry Problems (3).** Prerequisite: 21 hours in the department and consent of the instructor. Investigation of special problems in the field of food and dairy industry. May be repeated for credit.
433. **Market Milk (3:2:3).** Prerequisite: D I 131. The fluid milk industry; milk and public health; city, state, and federal regulations and ordinances; production; transportation, handling of milk; cost studies; field trip.
435. **Food and Dairy Inspection and Quality Control (3:2:3).** Prerequisite: Consent of instructor. Municipal, state, and federal dairy and food regulations; inspection methods; methods of quality control; required field trip.
437. **Food Plant Management and Merchandising (3:3:0).** Prerequisite: D I 322. Organization and control of food plants; ethics and methods of merchandising; required field trips.
441. **Dairy Products Manufacturing (4:2:4).** Prerequisite: D I 231 and D I 241. Problems in the manufacturing of butter, cheese, ice cream, and condensed milk products.

FOR GRADUATES

531. **Food and Dairy Industry Research (3).** Prerequisite: Consent of major professor. Scientific research in the field of food and dairy industry. May be repeated for credit.
535. **Food and Dairy Bacteriology Research (3).** Prerequisite: Consent of major professor. Scientific research in the field of food and dairy bacteriology. May be repeated for credit.
631. **Master's Thesis (3).** Enrollment required at least twice.

Department of Park Administration, Horticulture, and Entomology

This department supervises the following degree programs: *Bachelor of Science* and *Master of Science* in ENTOMOLOGY, HORTICULTURE, or PARK ADMINISTRATION. Degree requirements are given in the accompanying tables.

As a part of the training in park administration student majors are given the opportunity to work in parks departments throughout the United States and Canada. This work experience permits the students to secure valuable training in the fields of landscape architecture, urban planning, and parks design and administration.

The senior class customarily works on site developments for parks in Texas cities as a class project. Cities involved have included Andrews, Dallas, Lubbock, San Antonio, Tulia, and Amarillo.

The horticulture major allows the student to concentrate his work in one of three emphasis areas: ornamentals, production, or turf management. Students selecting the ornamental emphasis area are those with an interest in the activities of production, research, marketing, or maintenance within ornamental horticulture, floriculture, and the nursery industry.

The entomology curriculum is a closely coordinated program stressing both academic and applied phases of the profession. Summer study away from the campus is promoted through a work-study program with state and federal agencies and industry.

The entomology section sponsors an annual short course for pest control operators from the Texas, New Mexico, Oklahoma region. Other short courses

are conducted for area chemical dealers, gin operators, and students interested in cotton and grain sorghum insects and their control. Research on mosquito and fly control, cotton insects, grain sorghum insects, and wheat insects is conducted in cooperation with the U.S. Public Health Service, U.S. Department of Agriculture, State Department of Agriculture, Texas Agricultural Experiment Stations, and local growers.

Park Administration Curriculum.

FIRST YEAR (See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
GOVT 231, Amer. Govt., Org.	3	P A 134, Fund. of Park Plan.	3
AG E 232, Plane & Topo. Surv.	3	GEOL 143, Geology	4
ENTO 231, Intro. to Entom.	3	HORT 233, Plant Matl. II	3
ENG 233, Tech. Writing	3	GOVT 232, Amer. Govt., Org.	3
HORT 232, Plant Matl. I	3	BIOL 142, Zoology	4
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
16-17		18-19	

THIRD YEAR

Fall		Spring	
P A 3311, Landscape Arch. I	3	P A 3312, Landscape Arch. II	3
P A 339, Landscape Constr.	3	AECO 341, Ag. Statistics	4
HORT 338, Turf Grass Mgt.	3	HIST 231, Hist. of U.S. to 1877	3
ARCH 332, Hist. Landscape Arch.	3	BLAW 338, Bus. Law I	3
SOC 230, Intro. to Soc. or	3	P A 3313, Basic Park Admin.	3
SOC 4312, The Urban Comm.	3	Electives	2
Electives	3		
18		18	

FOURTH YEAR

Fall		Spring	
P A 441, Landscape Arch. III	4	P A 442, Landscape Arch. IV	4
HIST 232, Hist. of U.S. since 1877	3	ARCH 337, Prin. of City Plan.	3
HORT 410, Seminar	1	SPCH 338, Bus. & Prof. Spch.	3
P A 422, Park Admin.	2	P A 431, Munic. Rec. Admin.	3
RMGT 231, Intro. Wildlife Mgt.	3	BOT 436, Plant Geography	3
ANTH 231, Origin & Nature of Man	3	Electives	3
16		19	

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

Entomology Curriculum.

FIRST YEAR (See Uniform Freshman Year)

SECOND YEAR

Fall		Spring	
ENTO 231, Intro. Entom.	3	ENTO 322, Livestock Pests or	
BIOL 142, Zoology	4	ENTO 323, Hort. Pests	2
CHEM 142, Gen. Chem.	4	HIST 231, Hist. of U.S. to 1877	3
GOVT 232, Amer. Govt., Org.	3	CHEM 341, Org. Chem.	4
MBIO 231, Bacteriology	3	ENG 233, Tech. Writing	3
P.E., Band, or Basic ROTC	1-2	HORT 231, Vegetable Crops	3
18-19		Elective	2
		P.E., Band, or Basic ROTC	1-2
		18-19	

THIRD YEAR

Fall		Spring	
ENTO 321, Field Crop Insects	2	ENTO 334, Insect Morph.	3
ENTO 335, Insect Taxonomy	3	BOT 331, Plant Physiol.	3
GOVT 232, Amer. Govt., Funct.	3	HIST 232, Hist. of U.S. since 1877	3
BOT 332, Plant Pathology	3	SPCH 338, Bus. & Prof. Spch. or	3
*Agronomy course	3	BLAW 338, Bus. Law	3
ZOOL 335, Comp. Invert. Zool.	3	Electives	5
17		17	

FOURTH YEAR

Fall		Spring	
ENTO 432, Insect Ecology	3	ENTO 421, Immature Insects	2
ENTO 441, Insect Tox. & Physiol.	4	ENTO 431, Ag. Compounds	3
*Agronomy course	4	ENTO 4311, Med. Entom.	3
Electives	6	ENTO 4312, Acarology	3
17		ENTO 410, Seminar	1
		Electives	6
		18	

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* Must be elected from AGRO 241, 331, 341, 4313, 433.

Horticulture Curriculum.**FIRST YEAR**
(See Uniform Freshman Year)**SECOND YEAR**

Fall		Spring	
BIOL 142, Zoology	4	AGRO 241, Soils	4
CHEM 142, Gen. Chem.	4	CHEM 341, Intro. to Org. Chem.	4
ENG 233, Tech. Writing	3	ENTO 231, Intro. Entom.	3
HORT 234, Propagation Meth.	3	P.E., Band, or Basic ROTC	1-2
P.E., Band, or Basic ROTC	1-2	*Other courses	6
*Other courses	3		
	18-19		18-19

THIRD YEAR

Fall		Spring	
MBIO 231, Bacteriology	3	BOT 331, Plant Physiol.	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
HORT 334, Floriculture	3	HORT 333, Fruit Culture	3
AECO 341, Ag. Statistics	4	*Other courses	8
*Other courses	5		
	18		17

FOURTH YEAR

Fall		Spring	
AGRO 341, Prin. of Genetics	4	ENTO 431, Ag. Compounds	3
BOT 332, Plant Path.	3	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	*Other courses	11
HORT 410, Seminar	1		
*Other courses	6		17
	17		

Hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* **Ornamentals Emphasis** (Orn. Hort.—Floral and Nursery): In addition to the above courses, the student electing the ornamentals emphasis must take the following courses: AG E 222 or 232, HORT 232, 233, 338, 3314, 430, and 436, plus 19 hours of electives, to be approved by the department.

* **Production Emphasis** (Fruits and Vegetables): In addition to the above courses, the student electing the production emphasis must take the following courses: AECO 236; AG E 222; AGRO 436 or 4311; HORT 231, 421, 430, 431, and 435, plus 17 hours of electives, to be approved by the department.

* **Turfgrass Management Emphasis**: In additions to the above courses, the student electing the turfgrass management emphasis must take the following courses: AG E 232; HORT 232, 233, 338, 421, 430, 432; P A 339, 3313, plus 13 hours of electives, to be approved by the department.

Courses in Park Administration.**FOR UNDERGRADUATES**

134. **Fundamentals of Park Planning (3:1:6)**. The study of graphics including lettering; basic forms, descriptive geometry, perspectives, and shades and shadows, as well as principles of design as each relates to park planning.
330. **Problems Course (3)**. Prerequisite: Student is assumed to have completed basic work which would equip him for the problem assigned. P A 330 is a junior level problems course designed to accommodate students in specific problems assigned during their in-service training.
339. **Landscape Construction (3:3:0)**. Prerequisite: Junior classification. Design and construction of landscape structures. Consideration is given to ethics, professional practices, specifications, quantity surveys, and construction materials. Working drawings and specifications of various landscape structures required.
3311. **Landscape Architecture I (3:1:6)**. Prerequisite: AG E 232, HORT 232 and 233, and P A 134. A basic course of landscape architecture, with special emphasis on the elements and principles of design, theory analysis, and application to projects in the design of private, semi-private, and public areas, such as homes, schools, play lots, school-park combinations, and community parks.
3312. **Landscape Architecture II (3:1:6)**. Prerequisite: P A 3311. A continuation of 3311, with intermediate landscape architectural problems of greater complexity, with emphasis on practical application. Includes residential developments, industrial parks, community play-fields, city and state parks, and large recreational facilities.
3313. **Basic Park Administration (3:3:0)**. Prerequisite: Junior classification. A study of administration, operation, management, and history of city, county, state, and national parks. Spring semester only.
410. **Seminar (1:1:0)**. Prerequisite: Senior standing in park administration. Assigned readings, informal discussions, and oral reports and papers.
425. **Park Administration Problems (2)**. Junior or senior standing or permission of the chairman of the department.
431. **Municipal Recreation Administration (3:3:0)**. Prerequisite: Junior standing. Permission of the department chairman. A course in basic principles of municipal recreation with practical suggestions for carrying these principles into effect.

FOR UNDERGRADUATES AND GRADUATES

422. **Park Administration (2:2:0)**. Prerequisite: Upperclass standing with consent of instructor. The function and operation of park departments as related to other agencies of the city, county, state, and federal governments. Fall semester only.
430. **Park Administration Problems (3)**. Prerequisite: Open to all advanced students having satisfactory scholastic records. An investigation of a problem in the field of special interest

to the individual student concerned. May be repeated for credit with approval of department chairman.

441. **Landscape Architecture III (4:1:8).** Prerequisite: P A 3312, senior standing or special permission from department chairman. Advanced landscape architectural problems, with emphasis on investigation, analysis, research, application, and graphics relative to large scale projects. Investigation and planning of city, metropolitan, and regional parks and park systems and their relationship to other governmental functions, such as zoning, traffic, expansion, school sites, shopping centers, industrial parks, and other related land use problems.
442. **Landscape Architecture IV (4:1:8).** Prerequisite: P A 441. A continuation of P A 441, with advanced landscape architectural problems in the investigation and planning of city, metropolitan, and regional parks and park systems. Area cities are used as practical problems.

FOR GRADUATES

531. **Park Administration Research (3).** Prerequisite: Consent of major professor. An outline of a specific problem of specialized study not included in regular course work. May be repeated for credit with approval of major professor.
540. **Advanced Park Administration (4:3:2).** Essential to the development of advanced park administration concepts is the ability to ferret out fundamental facts, to analyze this data and make critical accurate judgments for sound decisions and subsequent action. The aims and topics included within the syllabus outline are geared to achieve these ends.
541. **Advanced Park Planning and Design (4:1:8).** The advanced student, through analysis and interpretation, develops comprehensive long-range plans for area, regional, state, and national park systems. Recreational needs, tourism, conservation, recreational economics, policies, and legislation are incorporated into this research and planning.
542. **Advanced Park Planning and Design (4:1:8).** Prerequisite: P A 541. A continuation of P A 541, in which the advanced student, through analysis and interpretation, develops comprehensive long-range plans for area, regional, state, and national park systems.
631. **Master's Thesis (3).** Enrollment required at least twice.

Courses in Horticulture.

FOR UNDERGRADUATES

131. **Principles of Horticulture (3:2:2).** Fundamental principles and practices of growth, maintenance, and use of horticultural plants, and landscape of small homes.
231. **Vegetable Crops (3:2:3).** Prerequisite: HORT 131. Principles and practices in production of the major truck crops. Fall semester only.
232. **Plant Materials I (3:2:2).** Prerequisite: HORT 131. Identification, characteristics, and use of plant materials of ornamental value, from the ferns and conifers to the rose family. Fall semester only.
233. **Plant Materials II (3:2:2).** Prerequisite: HORT 131 and 232. Identification, characteristics, and use of plant materials of ornamental value, from the rose and legume families through the composites. Spring semester only.
234. **Propagation Methods (3:2:3).** Prerequisite: HORT 131, CHEM 141. Propagation techniques of commercial nurseries and greenhouse ranges; study of the physiological reaction and cutting material.
320. **Horticulture Problems (2:2:0).** Prerequisite: Completion of basic work in the student's program which would equip him for the problem assigned. Subject to approval of the department.
333. **Fruit Culture (3:3:0).** Prerequisite: HORT 131. Principles of fruit culture, nutrition, irrigation, training, and pruning, fruit development and handling, orchard establishment, and varieties. Required field trips. Offered spring semester 1969 and alternate years.
334. **Principles of Floriculture (3:2:3).** Greenhouse construction, heating, fundamental soil treatment, and the basic principles of flower production and floriculture marketing. Offered fall semester 1969 and alternate years. Required field trips.
338. **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. Offered spring semesters only.
3314. **Fundamentals of Home Landscape Design (3:2:2).** Prerequisite: HORT 131. Aimed at providing sufficient background for the student to plan and analyze the home landscape setting and to design suitable solutions for this problem. Fall semester only.
410. **Seminar (1:1:0).** Prerequisite: Senior standing in horticulture and park management. Assigned readings, current advances, informal discussions, and oral reports and paper.

FOR UNDERGRADUATES AND GRADUATES

421. **Arboriculture (2:1:3).** Prerequisite: HORT 333 and senior standing. The physiological principles and industry practices in the production, moving, care, and maintenance of ornamental trees and shrubs. Required field trips. Offered spring semester 1968 and alternate years.
425. **Horticulture Problems (2).** Prerequisite: Open to all advanced students having satisfactory scholastic records. Investigation of a problem in the field of special interest to the individual student concerned.
430. **Horticulture Problems (3).** Prerequisite: Open to all advanced students having satisfactory scholastic records. Investigation of a problem in the field of special interest to the student. Repeated for credit with approval of department chairman.
431. **Advanced Fruit Production (3:3:0).** Prerequisite: HORT 333, advanced standing in agriculture. Practices and problems in the commercial production, storage, and handling of the important fruit crops. Offered fall semester 1969 and alternate years.
432. **Advanced Turfgrass Management (3:2:3).** Prerequisite: HORT 338. Advanced problems of specialized turfgrass management, with special emphasis on golf course management and park lawns. Field trips required. Offered spring semester 1968 and alternate years.
435. **Advanced Vegetable Production (3:3:0).** Prerequisite: HORT 231, advanced standing in agriculture. Practices and problems in the commercial production and handling of important vegetable crops for fresh market and processing. Offered fall semester 1968 and alternate years.
436. **Advanced Floricultural Science (3:2:3).** Prerequisite: HORT 334. Junior standing. Recent cultural techniques of fertilization crop regulation and the detailed study of the factors

of culture of the principle floricultural crops. Required field trips. Offered spring semester 1968 and alternate years.

FOR GRADUATES

511. **Horticulture Seminar (1:1:0).** Review and discussion of current literature in the field. May be repeated for credit.
531. **Horticulture Research (3).** Prerequisite: Consent of major professor. An outline of a specific problem of specialized study not included in regular course work. May be repeated for credit with approval of major professor.
532. **Horticultural Crop Behavior (3:3:0).** Aimed at giving the graduate a recent approach to the modifications in crop responses and recently developed techniques used to regulate physiological responses of growth and production of horticultural crops. Fall semester only.
533. **Horticultural Plant Evaluation Techniques (3:3:0).** Aimed at giving the graduate some of the fundamental methods, means, data taking, and analysis to permit a clearer understanding and more thorough analytical techniques. Spring semester only.
631. **Master's Thesis (3).** Enrollment required at least twice.

Courses in Entomology.

FOR UNDERGRADUATES

110. **Problems in Entomology (1).** Specific assigned problems dealing with insect behavior or control. May be used for degree credit with dean's approval.
231. **Introductory Entomology (3:2:2).** An introduction to insects and their role in human affairs, particularly agriculture; emphasis on morphology and biology as applied to control of pest species; control materials and methods.
321. **Field Crop Insects (2:1:3).** Prerequisite: ENTO 231. Field crop pests; cotton, range crop, and small grains insect pests; storage pests. Fall semester only.
322. **Livestock Pests (2:2:0).** Prerequisite: ENTO 231. Livestock pests and associated insect problems. Life history and economic control. Spring semester only.
323. **Horticulture Pests (2:1:3).** Prerequisite: ENTO 231. The arthropod pests of ornamental, vegetable, and fruit crops. Recognition, biology, and control. Spring semester only.

FOR UNDERGRADUATES AND GRADUATES

334. **Insect Morphology (3:2:3).** Prerequisite: An introductory course in entomology. A study of form and function of the insect body. Structural adaptation. Spring semester only.
335. **Insect Taxonomy (3:2:3).** Prerequisite: An introductory course in entomology. Classification of insects. The student will be expected to have his own collection. Fall semester only.
410. **Seminar (1:1:0).** Prerequisite: Senior or advanced standing in entomology. Assigned readings, current advances, informal discussions, oral reports, and papers. May be repeated for credit.
421. **Immature Insects (2:1:3).** Prerequisite: ENTO 231. A course in the identification, alternate morphology and biology of immature insect forms. Spring semester only.
431. **Agricultural Compounds (3:3:0).** Prerequisite: An introductory course in entomology and CHEM 341. Nature, mode of action and uses of insecticides, fungicides, herbicides, and fertilizers. Spring semesters and summer terms.
432. **Insect Ecology (3:2:3).** Prerequisite: An introductory course in entomology. The adaptation of the insect to its biological and physical world. Population dynamics, macro- and micro-habitants, and insect responses. Fall semester only.
433. **Insect Natural History (3:2:2).** An introductory course for non-majors. The resources of the insect as applied to our understanding of life, the animal world, and man's relationship to insects.
441. **Insect Toxicology and Physiology (4:3:3).** Prerequisite: ENTO 231, CHEM 341. A study of physiological process of digestion, metabolism, nerve transmission, etc., and the toxic mechanisms used to combat insect pests. Fall semester only.
4311. **Medical Entomology (3:2:3).** Prerequisite: Advanced standing in zoology, premed, or agriculture. Insects, mites, and ticks as vectors of human disease and as pests. Spring semester only.
4312. **Acarology (3:2:3).** Prerequisite: Advanced standing in zoology, premed, or agriculture. The systematics, life histories, and control of mites affecting man, animals, and plants. Spring semester only.

FOR GRADUATES

521. **Advanced Economic Entomology (2:2:0).** Prerequisite: ENTO 231, ENTO 321, or graduate standing. Factors influencing insect control, with special emphasis on the principles of insect control, resistance, and new control measures, as they relate to specific insect problems.
522. **Literature and History of Entomology (2:2:0).** Prerequisite: A basic entomology course, permission of the instructor, or graduate standing. The background and development of entomology as a science is traced through its historical literature. Concepts of insect life and taxonomy from the ancients down to modern genetic concepts are developed.
523. **Advanced Insect Taxonomy (2:0:6).** Prerequisite: Basic entomology and ENTO 334, and ENTO 335, or permission of the instructor. Description, keys, and literature for determining insects to genus and species. A specialized group will be assigned for detailed study.
531. **Entomology Research (3).** Prerequisite: Consent of major professor. An outline of a specific problem of specialized study not included in regular course work. May be repeated for credit with approval of major professor.
631. **Master's Thesis (3).** Enrollment required at least twice.

School of Arts and Sciences

The primary function of the School of Arts and Sciences is to provide a liberal education for its students. Through the programs offered by its 20 departments, the school aims to develop habits of independent and creative thinking which will enrich the lives of its graduates and enable them to become participating members of their community. Through its courses in the liberal arts and the sciences, the school also provides the background for further specialization and is of special value to the student who comes to college without a predetermined field of study. Although it is one of the traditions of American education that the student shall have the right to select for himself the areas of study he wishes to follow, experience has demonstrated that certain studies are of fundamental importance, not only in providing a base from which to explore more definite realms of knowledge, but also in affording lifelong personal satisfaction and enjoyment. These basic studies are to be found among those offered by the School of Arts and Sciences.

The work offered in this school is most diversified. Herein the student can learn of the society in which he lives and how that society developed through its history, its literature, its art and music. Through political science the student learns how society governs itself, and through the physical and biological sciences he learns the fundamental laws of the universe. The student is enabled to broaden his concepts and by liberal education to attain values which last a lifetime.

Students previously enrolled in a program leading to a Bachelor of Science in Education degree (elementary or secondary) in the School of Arts and Sciences may complete the program as specified in the catalog under which they entered, but they will be enrolled in the School of Education.

The departments in the School of Arts and Sciences participate extensively in the graduate programs of Texas Technological College on both master's and doctor's levels. Details are available in the *Catalog of the Graduate School*.

The School of Arts and Sciences is divided into instructional departments which offer course work and supervise the degree programs. The student should note carefully any particular requirements indicated by a department in which he plans to major or minor. For most of the Bachelor of Science programs specific curricula have been designed and are presented in tables under the appropriate departmental heading. There are several interdepartmental degree programs which are described in a separate section below.

Courses are listed on the following pages by departments. Each course is listed by name and number, and many 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. The student thus has an opportunity to take courses which broaden his educational experience or which provide concentration in a particular subject. The wise student will include courses of both kinds.

Course Load. The amount of work normally carried by a student in the School of Arts and Sciences should not exceed 17 hours per semester. Unless specifically prescribed by a particular curriculum, loads exceeding 17 hours or loads of less than 12 hours must have the specific approval of the dean. In calculating the load, the dean will consider all active correspondence courses, grade-point averages, and the student's extracurricular work. Course loads in excess of 20 semester hours will not be approved.

Freshman Year. Entering freshmen are expected to follow the program outlined below during their first year in college:

Sem. Hrs.

1. English composition	6
2. Mathematics, foreign language, science, or history	20-22
3. Electives, if not included under 2 above	6
4. Physical education, band, or basic ROTC	2-3
Total for both semesters of freshman year	34-37

The entering freshman develops his program in conference* with his academic adviser, to whom he is assigned for his first year in college. The student reports to his adviser for such individual conferences or group meetings as are needed for the purpose of orienting himself to academic regulations and procedures, curricula, and degree requirements in the student's various areas of interest.

Required freshman courses should be taken during the freshman year and not postponed. During the sophomore year the student should take the second year of English and physical education, band, or basic air or military science, and should remove all unabsolved freshman requirements. Students who postpone taking required freshman subjects until the senior year must still take such subjects, though the credit therefrom will not apply toward the hours required for a degree. For the purpose of this regulation a senior is considered as a student with a minimum of 96 semester hours to his credit.

Special and Interdepartmental Programs

Biblical Literature. This is not a degree program but serves to introduce students to that world of literature, the Bible, which has so broadly affected Western culture. Guidance is given in the study of its moral and religious teachings and their relevance to life today. Though recognized for credit by the College, all courses are taught off campus in centers provided by the churches at no expense to the College. Courses are described in the departmental section on the following pages.

Bilingual Secretarial Program. A degree of Bachelor of Arts with a bilingual secretarial major is offered in cooperation with the Department of Secretarial Administration in the School of Business Administration. The curriculum is arranged by student consultation with the chairman of the foreign language department of the student's language emphasis.

The degree requirements follow:

- (1) Completion of the general requirements for a Bachelor of Arts degree.
- (2) Completion of a major (of 33 semester hours) in French, German, or Spanish and a minor (minimum 18 hours) in an academic subject.
- (3) Completion of an additional 25 semester hours in courses in the Department of Business Education and Secretarial Administration. This will not normally cause the total hours required for a degree to exceed 123 because the usual elective courses may be used for this purpose. For students who have previously attained basic skills in typing and/or shorthand the requirements in business education and secretarial administration will be proportionately reduced. Courses in typing and shorthand may be counted as semester hours toward the degree if this program is completed.

Economics. A degree of Bachelor of Arts with an economics major is offered in cooperation with the Department of Economics in the School of Business Administration. The curriculum is arranged by student consultation with the Chairman of the Department of Economics.

The degree requirements are those of the Bachelor of Arts degree with a major (minimum of 30 semester hours) in economics.

Education. Students in the School of Arts and Sciences who wish to do so may major in education by completing the standard requirements for the Bachelor of Arts degree, including a minimum of 30 semester hours in courses in education as arranged with the chairman of the appropriate department within the School of Education. A minor in education may be included as part of the requirements for a Bachelor of Arts degree.

Honors Studies. In addition to Honors courses in separate departmental listings, the following interdepartmental seminars are administered by the Director of Honors. Students expecting to be graduated in Honors Studies are required to complete at least two of these seminars.

Courses in Honor Studies.

A&S H 331. 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. Participating departments: English and Philosophy.

A&S H 332. Honors Seminar in Sciences (3:3:0). Prerequisite: Junior standing and participation in Honors Studies. Study of origin, development, and interrelationships of land-form and life-form. Historical and current concepts are emphasized. Participating departments: Biology and Geosciences.

A&S H 333. 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. Participating departments: Economics, Education, Government, History, Psychology, and Sociology.

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 departments of Government, History, and Classical and Romance Languages.

For the major, 30 semester hours must be completed from among the following courses:

Anthropology and Sociology: 3 to 6 hours in ANTH 4316, SOC 336.

Economics: 3 hours in ECO 339 (Prerequisite: ECO 231, 232).

Spanish/Portuguese: Either 6 hours of SPAN 4321, 4322, 4323, 4324, 4325, 4326, 4327, 4328, 4329, or 6 hours of PORT 430, 435, 436.

Geography: 3 to 6 hours in GEOG 4363, 4364.

Government: 3 to 6 hours in GOVT 4374, 4375.

History: 6 to 12 hours in HIST 4321, 4322, 4323, 4324.

With prior approval, substitutions may be possible.

For the minor, 18 hours may be chosen from any field in which a minor is customarily taken. However, the same course may not be counted in both the major and the minor.

In addition, the standard requirements for a Bachelor of Arts degree must be met.

Liberal Arts. Freshmen or sophomores may major in a general program known as Liberal Arts until they select the major degree area in which they wish to graduate. Additional information may be obtained from the Liberal Arts Adviser, Paul J. Woods, S. Sc. 111.

Premedical and Predental. Colleges of medicine and dentistry require an applicant to present a certificate of graduation from an accredited high school, together with a minimum of two years of college work. Most medical schools require three years of college work, and many require a bachelor's degree. The course of study meets the usual requirements for entrance to medical school. For pre dentistry students, certain modifications may be advisable.

The premedical program is not designed to meet the minimum requirements of any specific medical school, but is planned to fit the student for the successful study of medicine. Each student is charged with the responsibility for knowing any special requirements of the medical school which he plans to attend and should consult the premedical adviser at each registration period. Application for admission to the professional school should be made through the office of the Chairman of the Premedical Advisory Committee, Miss Margret Stuart, Chem. 5. Professional aptitude and admission tests may be taken at Texas Technological College.

The degree of Bachelor of Arts for premedical or predental students may be obtained in one of two ways.

A. By completing the requirements for a B.A. while in residence at Texas Technological College. The major selected depends on the interest of the student.

B. By completing three years of work in the School of Arts and Sciences, totaling a minimum of 100 semester hours, and by graduation from a Class A medical or dental college. The following regulations apply:

1. Of the three years of preprofessional work, at least the junior year must be completed in residence at this College. 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 Bachelor of Arts degree at this College, with the exception of the major requirements.

3. The applicant for a degree under this plan must submit properly approved credentials from a Class A college of medicine or college of dentistry to the effect that the applicant has completed satisfactorily the work leading a degree of Doctor of Medicine or Doctor of Dental Surgery. Evidence of the degree will substitute for the degree requirements in a major field.

Premedical and Predental Curriculum.

FIRST YEAR

The curriculum should include CHEM 141, 142; BIOL 141, 142; ENG 131, 132, or 133, 134; MATH 131, 133, and 1-2 hours of P.E., Band, or Basic ROTC. In addition, 6-8 hours of work should be chosen in a foreign language or history (HIST 231, 232).

SECOND YEAR

Fall		Spring	
CHEM 251, Anal. Chem. or		ZOOL 241, Comp. Vert. Anat. or	
ZOOL 241, Comp. Vert. Anat.	4-5	CHEM 251, Anal. Chem.	4-5
PHYS 141, Gen. Phys.	4	PHYS 142, Gen. Phys.	4
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
Foreign Lang. or History	3-4	Foreign Lang. or History	3-4
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
15-18		15-18	

Prenursing. See School of Home Economics.

Preprofessional Programs. Basic courses for entrance into seminaries and into schools of optometry and pharmacy may be completed at Texas Technological College. Preministerial students may receive advice from the Chairman of the Sociology Department; preoptometry students from the Chairman of the Physics Department; prepharmacy students from the Chairman of the Chemistry Department.

Recreation. See departments of Health, Physical Education, and Recreation for men or women.

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 School of Education. The student should refer to the section of this catalog describing teacher education and should consult with the chairman of the department in which he wishes to major.

General Degree Requirements

Requirements for the degree of Bachelor of Arts also apply to all other degrees offered through the School 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 the physical, biological, and social sciences. It provides also the factual basis and the insights requisite for specialized study and professional work in these fields.

The following are the general requirements for this degree:

	Sem. Hrs.
1. English	12
2. Foreign Language	12-14
A student must complete 12 to 14 hours in the same language. Courses at the freshman level may not be used to fulfill this requirement if a student has studied this language for two or more years in high school.	
3. Mathematics	0-6
If 3½ units of mathematics including 2 of algebra, 1 of geometry, and ½ of trigonometry are accepted for admission, no further courses in mathematics are required. If 3 units are accepted, including 2 of algebra and 1 of geometry, 3 semester hours are required. If these admission requirements are not met, 6 hours of mathematics are required.	
4. Required Government and History	12
5. Social science other than major or minor and in addition to the legislative requirements in government and history above	6
6. Laboratory Science	8-16
If 2 or more units of laboratory science, biological or physical or both, but not including general or applied science, are accepted for admission, one year of a laboratory course in college will satisfy the natural science requirement. If this	

admission requirement is not met, one year of two sciences or two years in one science must be completed.

- | | |
|--|---------|
| 7. Fine Arts | 6 |
| ART 130, 131, 4310, 4311; M LT 238, 239; P E 3313; SPCH 231, 4352. | |
| 8. Major, minor, and electives sufficient with the above courses to total a minimum of 123 semester hours, not including physical education, band, or basic ROTC | 4-6 |
| 9. Physical Education, Band, or ROTC | 4-6 |
| Total for degree | 127-129 |

The student should have selected his major and minor fields by the time he reaches his junior year. In the majority of cases, students completing the requirements for the degree of Bachelor of Arts will carry their major and minor work in departments of this school. For the major subject he 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,* 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 chairman of the department concerned. Students who postpone taking required freshman subjects until their senior year must still take such subjects but the credit therefrom will not apply towards the hours required for a degree.

For the Bachelor of Arts degree, a minimum of 40 semester hours of junior and senior work must be presented; not more than 42 semester hours in one subject may be counted; not more than 12 hours in Biblical history and literature may be counted; not more than 8 hours may be counted in applied music and/or music ensemble, except for students offering music as a major or minor; not more than 24 hours in the technical or professional subjects of agriculture, business administration, engineering, and/or home economics may be counted as electives; and courses in shorthand and typewriting may not be offered for this degree except in the bilingual secretarial major.

Bachelor of Science. The curriculum for the degree of Bachelor of Science places greater emphasis on specialized training in mathematics and the sciences. The following are the requirements for this degree:

	Sem. Hrs.
1. English	12
2. Foreign Language	12-14
3. Mathematics	6
4. Required Government and History	12
5. Major, minor, and electives sufficient with the above courses to total a minimum of 124 semester hours, not including physical education, band, or basic ROTC	4-6
6. Physical Education, Band, or ROTC	4-6
Total for degree	128-130

Both a major and a minor are required for the Bachelor of Science degree, and each is to be completed within one of the separate subject matter fields of microbiology, botany, chemistry, geosciences, mathematics, physics, or zoology. The minimum requirements for the major and minor are 36 and 18 semester hours, respectively, including a minimum of 18 hours advanced work in the major and 6 advanced hours in the minor.

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 Medical Technology. The curriculum leading to the degree of Bachelor of Science in Medical Technology requires a minimum enrollment of three academic years and one summer term in the School of Arts and Sciences and 12 months' training in a school of medical technology approved by the American Society of Clinical Pathologists. The specific courses for the degree program are provided. Transfer students from other colleges or from other degree plans will be integrated into the degree program with as little loss of work and time as the requirements permit. A student is required to be in residence at the College for two semesters, during which he must complete 30 semester hours of work; at least 24 of the last 30 hours offered for credit must be completed in residence. An overall C average on work taken at Texas Technological College is required.

* An exception in foreign languages is explained under the department concerned.

Bachelor of Science in Physical Education (Men and Women).

Sem. Hrs.

1. English	12
2. Required Government and History	12
3. Mathematics or Foreign Language	6-8
4. Psychology 335	3
5. Sociology	3
6. Speech	3
7. Laboratory Science	8-14
8. Major, minor, and electives sufficient with the above courses to total a minimum of 128 semester hours. A minor of at least 18 hours including 6 hours of advanced courses is required on this degree. If a student wishes to complete requirements for a certificate he must take required courses in the School of Education which will count as electives.	

Bachelor of Music Education. The Bachelor of Music Education degree is for the student who expects to teach or direct vocal or instrumental music in the public schools.

Minimum requirements for the degree of Bachelor of Music Education are as follows:

Sem. Hrs.

1. English	12
2. Required Government and History	12
3. Foreign Language	6-8
4. Science or Mathematics	6-8
5. Academic Electives	6
6. Professional Education and Student Teaching	18
7. Applied music, music literature, music education, music theory, music ensemble (band, chorus, orchestra, opera), and free electives, to total a minimum of 130-134 semester hours, not including physical education, band, or basic ROTC.	
8. Physical Education, Band, or ROTC	4-6
Total for degree	134-140

Bachelor of Music. Minimum requirements for the degree of Bachelor of Music (Applied Music) are as follows:

Sem. Hrs.

1. English	12
2. Required Government and History	12
3. Foreign Language	6-22
4. Applied music, music literature, music education, music theory, music ensemble (band, chorus, orchestra, opera theater), and free electives to total a minimum of 124 to 132 semester hours, depending upon the major, not including physical education, band, or basic ROTC.	
5. Physical Education, Band, or ROTC	4-6
Total for degree	128-138

Department of Art

In September of 1967, the Department of Art was formed by combining the applied arts and the allied arts programs. Due to this action, a complete revision of art curricula at Texas Technological College has been undertaken. Students who were enrolled in the art programs prior to September 1968 have the option of changing to the new program or completing their present program according to the catalog under which they entered. Entering students may select programs with majors in advertising art and design or in art with an option in general art, studio, or interior design.

These art programs lead to the following degrees: *Bachelor of Advertising Art and Design*, *Bachelor of Arts*, or *Bachelor of Science in Education* with a teaching field in Art.

The Department of Art has two major purposes: to provide (1) degree programs that lead to professional development in the visual arts, and (2) a general nonprofessional degree program for the liberal arts students. Also, the department offers courses which are designed to appeal to nonmajors who desire experience in the visual arts as part of their liberal education.

The department reserves the right to retain, exhibit, and reproduce work submitted by students for credit in any course. Work submitted for grade is the property of the department and remains such until it is returned to the student by the department.

At the end of the sophomore year the major will be required to have a 2.00 overall grade point average and a 2.00 in studio courses to proceed to upper level studio courses.

Transfer students will be required to present a portfolio of their art work for departmental evaluation which will be used to determine admission to studio courses.

Freshman Core. All students majoring in art or advertising art and those establishing a teaching field in art are required to take the freshman core which consists of the following courses:

ART 120	Introduction to Drawing
ART 121	Introduction to Drawing
ART 132	Introduction to Design
ART 142	Introduction to Design
ART 130	History of Art
ART 131	History of Art

Art Major. Students working toward a Bachelor of Arts degree in art must (1) complete the freshman core in art, (2) complete sufficient electives in art to total 42 hours, including the freshman core, (3) complete the other requirements for the Bachelor of Arts degree. In selecting the art electives a student may specialize in studio or interior design. For the studio option, the departmental chairman should be consulted regarding appropriate course requirements. Those selecting interior design must take the following art courses as part of their art electives: ART 2327, 3325, 3326, 4325, 4326, 4327, and 4329.

Advertising Art and Design Major. This program offers a high concentration of professional courses in two options relating to the commercial art field. The graphic design option offers the student the opportunity to prepare for a career in the advertising agency, the design studio, publications design, package design, and related areas. The illustration option offers preparation for advertising or story illustration for a variety of printed media.

Both the design and the illustration option require completion of the freshman art core with an additional two semesters of common courses which allow the student to postpone his choice of program until the end of the fourth semester. Some advanced courses require submission of a portfolio of work to the faculty as a condition for admission. The curricula for both options are given below:

Freshman Art Core (17 semester hours, required for both options)

Required Art Courses (38 semester hours, required for both options)

ART 230, 231	Graphic Design I
ART 2321	Perspective I
ART 2322	Type as a Design Element
ART 232	Life Drawing I
ART 235	Introduction to Printmaking
ART 2312	Life Drawing II
ART 3220	Figure Indication
ART 330	Advanced Drawing
ART 434	Advanced Problems
ART 4321	Advertising Art for Production
ART 4312	Contemporary Art History
ART 4313	Seminar in Art History

Additional Required Art Courses for Graphic Design Option Only

ART 3320, 3321	Graphic Design II
ART 223	Introduction to Painting—Oil
or	
ART 224	Introduction to Painting—Synthetic Media
or	
ART 225	Introduction to Painting—Watercolor
or	
ART 228	Introduction to Pottery
ART 3322	Lettering
ART 4318, 4319	Advanced Graphic Design

Selected art electives: Painting, Printmaking, or Pottery above the introductory level (6 semester hours)

Art elective (3 semester hours)

Additional Required Art Courses for Illustration Option Only (23 semester hours)

ART 223 Introduction to Painting—Oil

or

ART 224 Introduction to Painting—Synthetic Media

or

ART 225 Introduction to Painting—Watercolor

ART 330 Advanced Drawing (repeat once for credit)

ART 3323 Illustration I

ART 3324 Illustration II

ART 4322 Advanced Illustration

ART 4323 Experimental Illustration

Selected art electives: Painting, Printmaking, or Pottery above the introductory level (6 semester hours)

Required Courses in other departments (58-60 hours)

English, 12 hours

MATH 135

Foreign Language, 6-8 hours

History, 6 hours

Government, 6 hours

SPCH 338

JOUR 3351

PHYS 237 or JOUR 3313

MKT 334

Electives, 9 hours

P. E., Band, or ROTC, 4 hours

Teacher Education. Students desiring to teach in the public schools may obtain elementary, broadfield-secondary, or all-level certification in art. These certification plans are available through two degree programs: *Bachelor of Science in Education* and *Bachelor of Arts*. The art course requirements for the secondary and all-level programs are as follows:

Freshman Art Core (17 semester hours)

Required Art Courses (31-34 semester hours)

ART 221 Introduction to Enameling

ART 222 Introduction to Textiles

ART 223 Introduction to Painting—Oil

ART 224 Introduction to Painting—Synthetic Media

ART 225 Introduction to Painting—Watercolor

ART 227 Introduction to Jewelry

ART 228 Introduction to Ceramics

ART 229 Introduction to Sculpture

ART 234 Presentation Techniques for Art Education

ART 235 Introduction to Printmaking

ART 236 History and Philosophy of Art Education

ART 3318 Crafts in Elementary Education (required for All-level Certificate only)

*ART 432 Art in Secondary Education

*ART 433 Secondary Art Curriculum

Art Electives (3-6 hours) to total 54 hours

These electives should be selected in consultation with an art education adviser.

Students majoring in elementary education may pursue an academic specialization of 24 semester hours in art. For information concerning specific courses, the departmental chairman should be consulted.

Courses in Art.

FOR UNDERGRADUATES

120. **Introduction to Drawing (2:0:6).** Fundamentals of freehand drawing.

121. **Introduction to Drawing (2:0:6).** Prerequisite: ART 120. Fundamentals of freehand drawing.

130, 131. **History of Art (3:3:0 each).** Architecture, sculpture, painting, and the minor arts from prehistoric times to the present. Emphasis is placed upon the arts as they reveal the visual aspects of man's social, political, and cultural growth. Illustrated lectures. Fulfills the fine arts requirement for Bachelor of Arts degree.

132. **Introduction to Design (3:0:9).** Fundamental principles of two-dimensional design.

* May also be counted as part of the 24-hour requirement in professional education.

136. **Design Applied to Daily Living (3:1:4).** For non-majors, elements and principles of design as they function in life of individuals.
138. **Survey of Drawing (3:1:4).** For non-majors, a survey of freehand drawing.
142. **Introduction to Design (4:1:9).** Prerequisite: ART 132. Fundamental principles of three-dimensional design.
220. **Crafts Design (2:0:6).** Prerequisite: Freshman art core. Exploration of design fundamentals as related to crafts.
221. **Introduction to Enameling (2:0:6).** Prerequisite: Freshman art core. Presentation of basic processes of enameling on metal.
222. **Introduction to Textile Design (2:0:6).** Prerequisite: Freshman art core. Introduction to textile design through a variety of decorative and structural processes.
223. **Introduction to Painting—Oil (2:0:6).** Prerequisite: Freshman art core. Introduction to basic painting in oil.
224. **Introduction to Painting—Synthetic Media (2:0:6).** Prerequisite: Freshman art core. Introduction to basic painting in synthetic media.
225. **Introduction to Painting—Watercolor (2:0:6).** Prerequisite: Freshman art core. Introduction to basic painting in watercolor.
227. **Introduction to Jewelry (2:0:6).** Prerequisite: Freshman art core. Basic techniques in jewelry construction.
228. **Introduction to Pottery (2:0:6).** Prerequisite: Freshman art core. Introduction to hand building methods, glaze application, and decorative techniques.
229. **Introduction to Sculpture (2:0:6).** Prerequisite: Freshman art core. Compositional study of the relationship between form and space with emphasis on basic sculptural concepts, terminology, and techniques.
2220. **Introduction to Interior Design (2:2:0).** An analysis of the fundamentals of designing through the study of draperies, furniture selection, color, textiles, wallpapers, and decorative accessories.
2221. **Beginning Interior Design Studio (2:1:3).** Prerequisite: Freshman art core. Beginning interior design studio. Experiences through studies in mediums, visual elements, and spatial representations.
230. **Graphic Design I (3:0:9).** Prerequisite: Freshman art core. Continuation of basic design with special emphasis on two-dimensional elements of composition.
231. **Graphic Design I (3:0:9).** Prerequisite: ART 230 and 2322. Basic problems in advertising and editorial design.
232. **Life Drawing I (3:0:9).** Prerequisite: Freshman art core. Study of anatomical structure, drawing from life.
233. **Painting Oil (3:0:9).** Prerequisite: ART 223 and 232. Application of beginning painting but with greater emphasis on aesthetics and individual exploration.
234. **Presentation Techniques for Art Education (3:1:4).** Prerequisite: Freshman art core. Exploration of different areas of visual presentation to include lettering, graphic representation and organization, and other display techniques.
235. **Introduction to Printmaking (3:0:9).** Prerequisite: Freshman art core. Problems in the four major printmaking areas. Silkscreen, etching, lithography, and woodcut. Emphasis on materials and techniques.
236. **History and Philosophies of Art Education (3:3:0).** Prerequisite: Freshman art core, sophomore classification. An investigation of the history and major philosophies of teaching the visual arts. (For art education majors only.)
237. **Jewelry (3:0:9).** Prerequisite: ART 227. Continuation of jewelry construction with further investigation of processes, introduction to casting methods.
238. **Pottery (3:0:9).** Prerequisite: ART 228. Introduction of throwing on the potter's wheel and continuation of hand building.
239. **Sculpture (3:0:9).** Prerequisite: ART 229. Introduction to technology and philosophy of studio and architectural sculpture with emphasis on carved media, concrete, welding, and casting.
2312. **Life Drawing II (3:0:9).** Prerequisite: ART 232. Drawing from life in a variety of media and approaches with emphasis upon aesthetic factors.
2315. **Printmaking—Woodcut and Etching (3:0:9).** Prerequisite: ART 235. In-depth study of printmaking methods of woodblock and etching. Emphasis on advanced techniques and aesthetic factors.
2317. **Survey of Crafts (3:1:4).** For non-majors, a survey of crafts.
2318. **Organization and Furnishing of Living Space (3:1:4).** Prerequisite: ART 136. For non-majors, the application of design principles to selection and arrangement of furnishings for a home with emphasis on function and aesthetics.
2319. **Costume Design (3:1:4).** Prerequisite: ART 136. For non-majors, drawing and rendering for apparel design with emphasis on application of art principles.
2321. **Perspective I (3:0:9).** Prerequisite: Freshman art core. Mechanical and optical perspective with special emphasis on picture making.
2322. **Type as a Design Element (3:0:9).** Prerequisite: Freshman art core. Families of type and type indication, use of type as a design element, printers' terms, copy fitting, measurements and techniques.
2327. **History of Interiors (3:3:0).** A survey of historical styles of interiors. Egyptian to 20th century.
321. **Problems in Visual Communications (2:0:6).** Prerequisite: Junior standing in business advertising or journalism. Basic elements of graphic design and introduction to technical, typographic, and production techniques.
328. **Appreciation of Art Today (2:2:0).** Development of aesthetic awareness through the examination of contemporary arts and crafts.
3220. **Figure Indication (2:0:6).** Prerequisite: ART 232. Sketching costumed model in chalk and various other media with controlled lighting for layout and illustration planning.
3222. **Perspective II (2:0:6).** Prerequisite: ART 232 and 2321. Principles of mechanical perspective and accurate shades and shadows as applied to renderings containing objects and human figures.
3224. **Contemporary Interiors (2:2:0).** Prerequisite: ART 2327 or departmental approval. A study of contemporary furniture movements and their effect on modern design in home furnishings.
330. **Advanced Drawing (3:0:9).** Prerequisite: ART 230 and 2312. Drawing from life with various media emphasizing aesthetic expression. May be repeated for credit.

331. **Enameling (3:0:9).** Prerequisite: ART 220 and 221. Experimentation with enameling techniques on various metals. May be repeated for credit.
333. **Painting in Synthetic Media (3:0:9).** Prerequisite: ART 224 and 232. Continuation of synthetic media painting, but with more emphasis on aesthetic and individual exploration.
334. **Painting in Watercolor (3:0:9).** Prerequisite: ART 225 and 232. Continuation of watercolor painting, but with more emphasis on aesthetics and individual exploration.
335. **Advanced Painting (3:0:9).** Prerequisite: ART 230 and 233, or ART 333, or ART 334. Advanced study of composition related to the human figure, still life, landscape and non-objective, emphasizing the development and application of aesthetic concepts. May be repeated for credit.
336. **Printmaking—Silkscreen and Lithography (3:0:9).** Prerequisite: ART 230, 232, 235. In depth study of printmaking methods of silkscreen and lithography. Emphasis on advanced techniques and aesthetic factors.
338. **Advanced Pottery (3:0:9).** Prerequisite: ART 220, 232, 238. Emphasis on aesthetic production using the clay medium as a means of expression. May be repeated for credit.
339. **Advanced Sculpture (3:0:9).** Prerequisite: ART 220, 232, 239. Structured to encourage mastery in specialized areas of sculpture with emphasis on development of individual techniques and philosophies. May be repeated for credit.
3310. **Textile Design—Dyeing Processes (3:0:9).** Prerequisite: ART 220, 222. Presentation of various dyeing processes, including batik and tie dyeing.
3311. **Textile Design—Yarn Processes (3:0:9).** Prerequisite: ART 220, 222. Presentation of various techniques for applied and structural uses of yarn, including weaving stitchery, macrame, and others.
3312. **Textile Design—Printing Processes (3:0:9).** Prerequisite: ART 220, 222. Presentation of various printing processes, including block printing and silk screening.
3316. **Survey of Pottery (3:1:4).** For non-majors, a survey of pottery.
3317. **Art in Elementary Education (3:1:4).** For non-majors, a practical application of current art education theories in promoting creative experiences for children.
3318. **Crafts in Elementary Education (3:1:4).** Application of current art education practices regarding three-dimensional work in providing creative experiences for children.
3319. **Survey of Painting (3:1:4).** For non-majors, a survey of various painting techniques and media.
- 3320, 3321. **Graphic Design II (3:0:9 each).** Prerequisite: ART 230. Advertising and editorial design including photographic layouts and design for television. May be repeated for credit.
3322. **Lettering (3:0:9).** Prerequisite: ART 2310 and 2322. Analysis of letter forms. Lettering for printed reproduction.
3323. **Illustration I (3:0:9).** Prerequisite: ART 2312 and 3222. Planning and rendering of advertising and editorial illustrations in various media with special emphasis on human figure.
3324. **Illustration II (3:0:9).** Prerequisite: ART 3220 and 3323. Production illustration for advertising with fashion illustration option. Editorial illustration problem of a specialized nature.
3325. **Home Planning (3:1:4).** Prerequisite: ART 2326 and 2321. Problems involved in planning a dwelling unit and its furnishings through floorplans, family specifications, and color coordinating.
3326. **Rendering for Interiors (3:1:4).** Prerequisite: ART 3325. Intermediate interior design studio with emphasis on freehand perspective drawing and rendering in mixed media that is relative to interior designing.
3327. **Equipment and Materials for Interiors (3:1:4).** Prerequisite: ART 3325. Properties, installation, and sales problems relating to lighting and other equipment and materials for interiors.

FOR UNDERGRADUATES AND GRADUATES

411. **Seminar for Elementary Specialization (1:1:0).** Prerequisite: Junior classification. Discussions built upon pertinent topics related to teaching art in elementary school. (For elementary education majors with an art specialization only.)
414. **Advanced Problems (1:0:3).** Prerequisite: Departmental approval. Advanced problems in an area of production in which student has achieved competence. May be repeated for credit.
424. **Advanced Problems (2:0:6).** Prerequisite: Departmental approval. Advanced problems in an area of production in which student has achieved competence. May be repeated for credit.
4221. **Interior Design Studio Procedure (2:2:0)** Prerequisite: ART 3327. Study of studio and workroom procedures and layout.
4222. **Professional Practices for Interior Design (2:2:0).** Prerequisite: ART 4326. Professional practices. Lectures and discussions of legal, business, ethical, and other aspects of the practice of interior design.
431. **Advanced Textile Design (3:0:9).** Prerequisite: Two of the following: ART 3310, 3311, 3312. Problems in textile design allowing the student to combine and explore at his own initiative. May be repeated for credit.
432. **Art in Secondary Education (3:3:0).** Prerequisite: ART 236. An investigation of the teaching of the visual arts in secondary schools and its relationship to the history and philosophies of art education. (For art education majors only).
433. **Secondary Art Curriculum (3:3:0).** Prerequisite: ART 236. An investigation and study of current art education practices and research regarding the secondary schools. (For art education majors only).
434. **Advanced Problems (3:0:9).** Prerequisite: Departmental approval. Advanced problems in area of production in which student has achieved competence. May be repeated for credit.
435. **Experimental Painting (3:0:9).** Prerequisite: ART 333 and departmental approval. Advanced exploration into aesthetics on a more individual basis. May be repeated for credit.
436. **Advanced Printmaking (3:0:9).** Prerequisite: ART 233, 330, 336. Advanced problems in two printmaking areas of the student's choice. Controlled projects and individual criticism. May be repeated for credit.
437. **Advanced Jewelry (3:0:9).** Prerequisite: ART 337 and departmental approval. Emphasis on the experimental elements in jewelry making. Student selects approved individual problems. May be repeated for credit.
438. **Experimental Pottery (3:0:9).** Prerequisite: ART 338 and departmental approval. Individual studies toward developing professional statement in clay; kiln construction and firing. May be repeated for credit.

439. **Experimental Sculpture (3:0:9)**. Prerequisite: ART 339 and departmental approval. Advanced study by mature students. Structured primarily toward advancement of existing philosophy and technology with emphasis on experimentation. May be repeated for credit.
- 4310, 4311. **History of Painting and Sculpture (3:3:0 each)**. Prerequisite: Junior classification. Illustrated lectures in the development of painting and sculpture from the 14th century to the present day, emphasizing the interrelations of the visual arts requirement for Bachelor of Arts degree. Three hours of library research per week.
4312. **Contemporary Art History (3:3:0)**. Critical examination of contemporary art.
4313. **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.
- 4318, 4319. **Advanced Graphic Design (3:0:9 each)**. Prerequisite: ART 3321 and portfolio evaluation. Advanced problems in graphic design, including printed media, television, point-of-purchase, package design, and typography. Coordination with ART 4321.
4321. **Advertising Art for Production (3:0:9)**. Prerequisite: ART 2322, 2310, 235. Preparation of original art for printed media, television, three-dimensional units, production materials and techniques. Coordination with Graphic Design III and Illustration III.
4322. **Advanced Illustration (3:0:9)**. Prerequisite: ART 3324 and portfolio approval. Continuation of Illustration II with attention to the needs of individual student portfolios.
4323. **Experimental Illustration (3:0:9)**. Prerequisite: ART 3324, 4320 and portfolio approval. Individual and experimental approach to illustration for advertising and editorial purposes. Photographic option.
4325. **Residential Interior (3:1:4)**. Prerequisite: ART 3327. Advanced study in various dimensions, purposes, and characters in relation to the small and large residential shelters. Cost estimating. May be repeated for credit.
4326. **Commercial Interior (3:1:4)**. Prerequisite: ART 3327. Analyzing furnishings, and estimating of moderate to large commercial or institutional spaces. May be repeated for credit.
4327. **Research in Dynamics of Interior Space (3:1:4)**. Prerequisite: ART 4326. Advanced problems relating to architectural space. May be repeated for credit.
4328. **Advanced Interior Problems (3:1:4)**. Prerequisite: ART 4326. Activity area planning concerning problems in designing for living space needs within certain areas of the home. May be repeated for credit.
4329. **Fieldwork in Interior Design (3:1:8)**. Prerequisite: ART 4326 and departmental approval. Field work wherein the student gains first-hand experience in a local business firm of his choice.

FOR GRADUATES

511. **Advanced Art Unit (1:0:3)**. Prerequisite: Graduate standing and departmental approval. Individual investigation in art. May be repeated for credit.
518. **Art Seminar (1:1:0)**. Prerequisite: Graduate standing and departmental approval. An investigation of current trends in art based on a survey of the literature.
531. **Special Problems in Art (3:0:9)**. Prerequisite: Graduate standing and departmental approval. Advanced, independent work in an art area in which a student has had previous training. May be repeated for credit.
532. **Research Methods in the Visual Arts (3:3:0)**. Prerequisite: Graduate standing and departmental approval. A survey of research methods applicable to the visual arts.
534. **Advanced Studio: Two-dimensional (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced two-dimensional studio problems.
535. **Advanced Studio: Three-dimensional (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced three-dimensional studio problems.
536. **Art in Home Economics (3:1:6)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced problems in the visual arts as they relate to home economics. Open only to graduate students in home economics. May be repeated for credit.
537. **Art for Exceptional Children (3:1:4)**. Prerequisite: Graduate standing and departmental approval. Review of the characteristics of typical children; application of this knowledge in unfolding the creative potentialities of each child through the use of art experience.
5335. **Theory and Practice of Art for Elementary Teachers (3:1:4)**. Prerequisite: Graduate standing and departmental approval. Art activities and experiences for the child.
5336. **Graduate Sculpture (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced problems in sculpture. May be repeated for credit.
5337. **Graduate Painting (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced problems in painting. May be repeated for credit.
5338. **Graduate Textile Design (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced problems in textiles. May be repeated for credit.
5339. **Graduate Pottery (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced problems in pottery.
5340. **Graduate Jewelry (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced problems in jewelry. May be repeated for credit.
5341. **Graduate Printmaking (3:0:9)**. Prerequisite: Graduate standing and departmental approval. The development and execution of advanced problems in printmaking. May be repeated for credit.

Department of Biblical Literature

The objective of this department is to provide sound academic courses in the literature found in the Bible, in order that students may better understand and appreciate this significant collection of documents. Courses are taught in four locations near the campus, under auspices of the Baptist, Churches of Christ, Methodist, and United Bible Chairs. Instructors are fully qualified and credit may be obtained for as many as 12 academic hours, which are counted as electives toward regular degree plans. This area of study is offered to students at no expense to the College, its cost being borne by the various supporting religious groups.

Courses in Biblical Literature.

110. **Introduction to Biblical Studies (1:1:0).** An introduction to the history, geography, and people of Biblical lands and places and a survey of the tools, materials, and methods of Bible study.
131. **Introduction to the Old Testament (3:3:0).** A study of the history, literature, and significant teachings of the Old Testament.
132. **Introduction to the New Testament (3:3:0).** A study of the history, literature, and significant teachings of the New Testament.
213. **The Book of James (1:1:0).** A study of the background and content of the Book of James.
235. **The Old Testament Prophets (3:3:0).** The Hebrew prophets, their place in history, and their contribution to religious thought.
236. **The Life and Teachings of Jesus (3:3:0).** The life, teachings, and significance of Jesus as presented in the gospels.
239. **History of Christian Thought (3:3:0).** The development of Christian systems of thought, from New Testament times through the nineteenth century.
2311. **Social Teachings of the Bible (3:3:0).** Biblical ethics for the present day. Such subjects as marriage, capital punishment, war, slavery, race relations, and other modern social issues are considered.
321. **Old Testament Poetry and Wisdom Literature (2:2:0).** Selected studies from the Psalms, Book of Job, and other poetic and wisdom literature in the Old Testament.
323. **The Letter to the Romans (2:2:0).** A study of the background and content of the Book of Romans.
324. **The Letter to the Hebrews (2:2:0).** A study of the background and content of the Book of Hebrews.
331. **The Gospel and Letters of John (3:3:0).** A study of the background and content of the Fourth Gospel and I, II, III John.
332. **Religions of the World (3:3:0).** A study of important features of various religions (e.g., Primitivism, Zoroastrianism, Hinduism, Buddhism, Confucianism, Taoism, Shinto, Zen, Islam, etc.).
422. **The Book of Revelation (2:2:0).** A study of the background and content of the Book of Revelation.
431. **Contemporary Christian Thought (3:3:0).** Christian theology as expressed in Neo-Thomism, Neo-orthodoxy, Christian Existentialism, Neo-liberalism, Contemporary evangelicalism, etc., European as well as American.
432. **Genesis and the Law (3:3:0).** The origin, history, and religious concepts of the Old Testament books of Law. Special attention given to problems of Genesis.

Department of Biology

This department supervises the following degree programs: *BIOLOGY, Doctor of Philosophy*; *BOTANY, Bachelor of Arts or Bachelor of Science, Master of Science, Doctor of Philosophy*; *MEDICAL TECHNOLOGY, Bachelor of Science in Medical Technology*; *MICROBIOLOGY, Bachelor of Arts or Bachelor of Science, Master of Science, Doctor of Philosophy*; *ZOOLOGY, Bachelor of Arts or Bachelor of Science, Master of Science, Doctor of Philosophy*.

Students majoring in microbiology, botany, or zoology may minor in any of these fields, provided the major and minor are not in the same field. Students majoring in botany for the bachelor's degree are expected to complete as a minimum 37 semester hours of the following courses in the Department of Biology: BIOL 141, 142, 331, 411; BOT 231, 331, 334, 339; ZOOL 241; and 9 additional hours in courses of junior and senior rank in microbiology, biology, or botany. Students majoring in zoology for the bachelor's degree are expected to complete as a minimum 37 semester hours of the following courses in the Department of Biology: BIOL 141, 142, 331, 411; ZOOL 241 and three of the following six: ZOOL 331, 332, 336, 437, 438, 439; BOT 231,* 334,* and 6 additional hours in courses of junior and senior rank in biology, entomology, microbiology, or zoology.

Students majoring in microbiology will be expected to complete 37 semester hours of the following courses: BIOL 141, 142, 331, 411; ZOOL 241 or 243; MBIO 331, 430, 432, 433; plus 6 semester hours of microbiology of junior and senior rank, or 3 semester hours of junior or senior rank and

* With the consent of the chairman of the department a premedical or a pre dental student may substitute another course offered in the Department of Biology.

ZOOL 333; and 3 additional semester hours of junior or senior rank offered in the Department of Biology. DI 335 may be counted as a course of junior rank in microbiology.

Chemistry provides an excellent minor for students majoring in microbiology. Students majoring in microbiology may minor in chemistry by completing the following courses: CHEM 141, 142, 251, 341, 342. If the student expects to do graduate work in microbiology, the following courses are recommended: CHEM 141, 142, 251, 325, 335, 326, 336. Students majoring in microbiology who minor in fields other than chemistry are expected to complete a minimum of 12 hours in chemistry, including organic chemistry (CHEM 141, 142, 341; or CHEM 141, 142, 251, 341).

Students majoring in one of the programs in this department may count no more than two courses with a grade of D, and minors in the department may count no more than one course with a grade of D. Students following the medical technology curriculum must maintain an overall C average in courses taken at Texas Technological College. At least one field course is very strongly recommended for all graduate students majoring in botany or zoology. This work may be taken from this institution or at one of the mountain, seashore, or other biological field stations.

Courses numbered 300 or above in microbiology or biology may be counted as part of the major in the degree programs in botany or zoology. Honors sections in BIOL 141, 142 are offered for all students in the Honors Program. Honors Research (BIOL 334) and Honors Thesis (BIOL 432) are offered in the Honors Program.

Premedical and pre dental students may major or minor in microbiology or zoology. Microbiology also offers programs useful to students whose interests are in sanitation, medical technology, home economics, and agriculture.

Specific curricula for the Bachelor of Science degree programs in botany, medical technology, microbiology, and zoology are set forth in the accompanying tables.

Teacher Education. Students completing the Bachelor of Arts or the Bachelor of Science degree, together with the special requirements for teacher certification, including required courses in professional education and in two teaching fields will be qualified to teach biology in the public schools of Texas. Chemistry, physics, or mathematics is recommended as a second teaching field.

Those students using biology as a teaching field for the degree of Bachelor of Science in Education should take the following courses: BIOL 141, 142, 331, 411; MBIO 331; BOT 334; ZOOL 243, 336, 437.

Students may elect a science teaching option. Under this plan a student must complete a minimum of 48 semester hours in the science departments. Eighteen of these hours must be above the sophomore level.

Students following this plan who wish a major concentration of courses in the Department of Biology should complete the following courses: BIOL 141, 142; CHEM 141, 142; GEOL 143, 144; PHYS 141, 142; BIOL 331, 411; MBIO 331; ZOOL 336, 437; and 5 semester hours of junior and senior rank in biology, chemistry, or physics.

Students following this plan who wish a major concentration of courses in departments other than the Department of Biology may take any of the following combinations of courses in biology:

1. 8 semester hours: BIOL 141, 142.
2. 12 semester hours: BIOL 141, 142, 331, 411.
3. 15 semester hours: BIOL 141, 142, 331, 411; MBIO 331.
4. 18 semester hours: BIOL 141, 142, 331, 411; MBIO 331; ZOOL 437.

Botany Curriculum, B.S. Degree.

FIRST AND SECOND YEARS			
Fall		Spring	
BIOL 141, Botany	4	BIOL 142, Zoology	4
*Chem., Geol., or Phys. (beginning course)	8	Mathematics	3
Mathematics	3	Chem., Geol., or Phys. (beginning course)	8
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
Foreign Language	4	BOT 334, Tax. of Fl. Plants	3
BOT 231, Surv. Plant Groups	3	Foreign Language	4
ZOOL 241, Comp. Vert. Anat.	4	P.E., Band, or Basic ROTC	2-3
P.E., Band, or Basic ROTC	2-3		
34-35		30-31	

THIRD AND FOURTH YEARS

Fall		Spring	
BOT 331, Plant Physiol.	3	BOT 339, Plant Anat.	3
Mbio., Biol., or Bot. (junior or senior)	6	Mbio., Biol., or Bot. (junior or senior)	3
BIOL 331, Heredity	3	Chem., Geol., or Phys.	
Chem., Geol., or Phys.		(beginning course)	4
(beginning course)	4	Science electives	9
Science or Mathematics minor	6	Foreign Language	3
Foreign Language	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	BIOL 411, Seminar	1
Elective	2	Science or Mathematics minor	6
	<hr/> 33		<hr/> 35

* This curriculum requires the completion of the freshman year in chemistry, geology, and physics.

Medical Technology Curriculum.

FIRST YEAR

Fall		Spring	
*BIOL 141, Botany	4	BIOL 142, Zoology	4
*CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Foreign Language	3-4	Foreign Language	3-4
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
	<hr/> 15-16		<hr/> 15-16

SECOND YEAR

Fall		Spring	
CHEM 251, Anal. Chem.	5	CHEM 341, Intro. Org. Chem.	4
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	4
Mathematics	3	Mathematics	3
Foreign Language	3	ZOOL 243, Human Anat. & Physiol.	4
P.E., Band, or Basic ROTC	1-2	Foreign Language	3
	<hr/> 15-16	P.E., Band, or Basic ROTC	1-2
			<hr/> 18-19

SUMMER SESSION
(Preceding Junior Year)

MBIO 331, Gen. Bact.	3
MBIO 430, Adv. Gen. Bact.	3
	<hr/> 6

THIRD YEAR

Fall		Spring	
MBIO 432, Immun. & Serology	3	MBIO 333, Commun. Diseases or	
MBIO 434, Path. Bact.	3	BIOL 431, Biol. Tech. or	
PHYS 141, Gen. Phys.	4	BIOL 331, Heredity	3
GOVT 231, Amer. Govt., Org.	3	PHYS 142, Gen. Phys.	4
HIST 231, Hist. of U.S. to 1877	3	CHEM 342, Physiol. Chem.	4
	<hr/> 16	GOVT 232, Amer. Govt., Funct.	3
		HIST 232, Hist. of U.S. since 1877	3
			<hr/> 17

FOURTH YEAR

Twelve months in a school of medical technology approved by the American Society of Clinical Pathologists.

* Certain changes are possible in order of work suggested, when circumstances indicate the advisability of such change. Biology 141, 142 and Chemistry 141, 142 should be completed during the first year, because these courses are prerequisite to the others required in these fields.

Microbiology Curriculum, B.S. Degree.

FIRST YEAR

Fall		Spring	
BIOL 141, Botany	4	BIOL 142, Zoology	4
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Foreign Language	3-4	Foreign Language	3-4
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
	<hr/> 15-16		<hr/> 15-16

SECOND YEAR

Fall		Spring	
*CHEM 251, Anal. Chem.	5	ZOOL 241, Comp. Vert. Anat. or	
ENG 231, Mast. of Lit.	3	ZOOL 243, Human Anat. & Physiol.	4
Mathematics	3	*CHEM 341, Intro. Org. Chem.	4
Foreign Language	3	ENG 232, Mast. of Lit.	3
P.E., Band, or Basic ROTC	1-2	Mathematics	3
	<hr/> 15-16	Foreign Language	3
		P.E., Band, or Basic ROTC	1-2
			<hr/> 18-19

THIRD YEAR

Fall		Spring	
MBIO 331, Gen. Bact.	3	MBIO 430, Adv. Gen. Bact.	3
Mbio., Biol., or Zool. (junior or senior)	3	Mbio., Biol., or Zool. (junior or senior)	3
Chem. (junior or senior) or science minor	5-6	Chem. (junior or senior) or science minor	5-6
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
BIOL 331, Heredity	3	Elective	3
	17-18		17-18

FOURTH YEAR

Fall		Spring	
MBIO 432, Immunol. & Serology	3	MBIO 433, Physiol. of Bact.	3
Mbio. (junior or senior)	3	BIOL 411, Seminar	1
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
Science electives	6	Science elective	2-3
Electives	2-3	Electives	6
	17-18		15-16

* See chemistry requirement options.

Zoology Curriculum, B.S. Degree.

FIRST AND SECOND YEARS

Fall		Spring	
BIOL 142, Zoology	4	BIOL 141, Botany	4
*Chem., Geol., or Phys. (beginning course)	8	Chem., Geol., or Phys. (beginning course)	8
Mathematics	3	Mathematics	3
ENG 131, Coll. Rhct.	3	ENG 132, Coll. Rhct.	3
ENG 231, Mast. of Lit.	3	ENG 232, Mast. Lit.	3
Foreign Language	4	Foreign Language	4
ZOOL 241, Comp. Vert. Anat.	4	**BOT 334, Tax. of Fl. Plants	3
**BOT 231, Surv. Plant Groups	3	P.E., Band, or Basic ROTC	2-3
P.E., Band, or Basic ROTC	2-3		30-31
	34-35		

THIRD AND FOURTH YEARS

Fall		Spring	
ZOOL 331, Anim. Histol., or ZOOL 336, Comp. Invert. Zool.	3	ZOOL 332, Comp. Vert. Embry. or ZOOL 433, Cell. Physiol.	3
Mbio., Biol., or Zool. (Junior or senior)	6	Mbio., Biol., or Zool. (junior or senior)	3
Chem., Geol., or Phys. (beginning course)	4	Chem., Geol., or Phys. (beginning course)	4
Science or Mathematics minor	6	Science electives	9
Foreign Language	3	Foreign Language	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
Elective	2	BIOL 411, Seminar	1
BIOL 331, Heredity	3	Science or Mathematics minor	6
	33		35

* This curriculum requires the completion of the freshman year in chemistry, geology, and physics, with the exception that premedical and preidental students may substitute additional courses in chemistry for the beginning courses in geology.

** With the consent of the chairman of the department, a premedical or a preidental student may substitute another course offered in the Department of Biology.

Courses in Biology.

FOR UNDERGRADUATES

- 141, 142. **Botany and Zoology (4:3:3 each).** Both botany and zoology are offered each semester; either may be taken first, but both, or their equivalents, should be completed before credit is received toward a degree. In both courses general principles and concepts are stressed.
312. **Experimental Heredity (1:0:3).** Prerequisite: BIOL 141, 142; prerequisite or parallel: BIOL 331. A survey of the techniques of experimental inquiry of the materials, methods, and the terminology used in genetics.
334. **Honors Research in Biology (3:0:9).** Prerequisite: Junior standing in biology and participation in the Honors Program. Independent investigation in botany, microbiology, or zoology.
411. **Biology Seminar (1:1:0).** Prerequisite: Senior standing in microbiology, botany, or zoology. Critical reviews of classical and recent literature and reports of original investigations. May be repeated for credit.
432. **Honors Thesis in Biology (3:3:0).** Prerequisite: Senior standing in biology and participation in the Honors Program. Preparation of a senior honors thesis in biology, botany, microbiology, or zoology.

FOR UNDERGRADUATES AND GRADUATES

331. **Heredity (3:3:0).** Prerequisite: 8 semester hours in the Biology Department. Principles of heredity with special reference to practical application in human affairs, heredity mechanisms, and problems.
333. **Bio-Ecology (3:2:3).** Prerequisite: BIOL 141, 142, or consent of the instructor. Introduction to the relationship of organisms to their environment. Field trips included at a minimum cost to the student.
431. **Biological Techniques (3:0:9).** Prerequisite: BIOL 141, 142, and senior standing or above; or consent of the instructor. Preparation and interpretation of microscopic slides of plant and animal tissues; research techniques.

FOR GRADUATES

511. **Seminar (1:1:0)**. Prerequisite: Graduate standing in biology. Required of all graduate students majoring in biology. May be taken more than once for credit.
512. **Advanced Experimental Heredity (1:0:3)**. Prerequisite: BIOL 141, 142; BIOL 331 or its equivalent. Experimental inquiry of heridity mechanisms; emphasis on *Drosophila* genetics.
532. **Population Genetics (3:2:3)**. Prerequisite: BIOL 331 or the equivalent. Genetics of natural populations, basic dynamics, and evolutionary mechanisms responsible for origin of species.
5312. **Cytogenetics (3:2:3)**. Prerequisite: BIOL 331 or AGRO 341. A study of genetic mechanisms of plants and animals and their correlated cytological interpretations. Human material will be included.
5313. **Biochemical Genetics (3:3:0)**. Prerequisite: BIOL 331 and CHEM 325, 335, 326, 336 or CHEM 341. CHEM 436 or CHEM 342 recommended. A comprehensive basis of heredity as interpreted through molecular and biochemical studies.
731. **Research (3)**. Prerequisite: Admission to doctoral study and consent of the instructor. May be repeated for credit. Research in areas of current interest.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Courses in Botany.

FOR UNDERGRADUATES

231. **Survey of the Plant Groups (3:2:3)**. Prerequisite: BIOL 141, 142. Morphology of plant groups not emphasized in BIOL 141. Field trips required.
334. **Taxonomy of the Flowering Plants (3:2:3)**. Prerequisite: BIOL 141, 142. Principles and practice in classification of flowering plants. Field trips required.

FOR UNDERGRADUATES AND GRADUATES

331. **Plant Physiology (3:2:3)**. Prerequisite: BIOL 141, 142; prerequisite or parallel, CHEM 141. Physiological processes as applied to the seed plants.
332. **Plant Pathology (3:2:3)**. Prerequisite: BIOL 141, 142; prerequisite or parallel, MBIO 231 or equivalent. Principles underlying the cause, identification, and control of plant diseases.
339. **Plant Anatomy (3:2:3)**. Prerequisite: BIOL 141, 142. Anatomy of the vascular plants.
436. **Plant Geography (3:3:0)**. Prerequisite: BIOL 141, 142, or consent of the instructor. Principles of the geography of plants; vegetation types, especially of North America. Occasional field trips.
438. **Morphology of Fungi (3:2:3)**. Prerequisite: BIOL 141, 142. Morphology as a basis for the classification of the fungi.

FOR GRADUATES

531. **Problems in Botany (3:0:9)**. Prerequisite: Graduate standing in botany. May be repeated for full credit in another field or with new materials in the same field. Offered at intervals.
534. **Advanced Plant Anatomy (3:0:9)**. Prerequisite: BOT 339. Advanced anatomy of vascular plants. Offered at intervals.
535. **Field Botany (3:3:0)**. Prerequisite: Graduate standing in botany. Readings, reports, and field work on assigned problems. Cost of field trips held to a minimum. May be repeated for credit with new materials. Offered at intervals.
536. **Taxonomy of Lower Green Plants (3:2:3)**. Prerequisite: BIOL 141, 142; BOT 231, 334; or consent of the instructor. Classification of the lower plants exclusive of the fungi. Lecture, laboratory, and field study.
537. **Morphology of the Vascular Plants (3:2:3)**. Prerequisite: BIOL 141, 142; BOT 231, 334; or consent of the instructor. The form and reproduction of plant groups. Field trips required.
538. **Advanced Taxonomy of the Vascular Plants (3:2:3)**. Prerequisite: BOT 334; consent of the instructor. A critical study of classification and nomenclature as applied to vascular plants.
539. **Plant Speciation (3:3:0)**. Prerequisite: BIOL 331 or AGRO 341. Genetic and environmental factors operating in plant evolution and species formation. A critical examination of natural and experimental populations.
5311. **Morphogenesis and Plant Growth Regulators (3:2:3)**. Prerequisite: BOT 331, CHEM 325, 335, 326, 336, or CHEM 341. CHEM 436 or 432 recommended. Study of environmental and chemical control of plant morphogenesis, growth and development. Photoperiodism, thermal regulation, naturally occurring hormones, and synthetic growth regulators.
630. **Master's Report (3)**.
631. **Master's Thesis (3)**. Enrollment required at least twice.
731. **Research (3)**. Prerequisite: Admission to doctoral study and consent of the instructor. May be repeated for credit. Research in areas of current interest.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Courses in Entomology.

FOR UNDERGRADUATES AND GRADUATES

4311. **Medical Entomology (3:2:3)**. Prerequisite: Advanced standing in zoology, premed, or agriculture. Insects, mites, and ticks as vectors of human disease and as pests.

Courses in Microbiology.

FOR UNDERGRADUATES

231. **Bacteriology (3:2:3)**. Prerequisite: 3 semester hours in the Biology Department. Morphology, physiology, and activities of bacteria and molds. Primarily for students of agriculture, home economics, and nursing.

FOR UNDERGRADUATES AND GRADUATES

331. **General Bacteriology (3:2:3)**. Prerequisite: 12 semester hours in the Department of Biology, Chemistry, Geology, or Physics; prerequisite or parallel: 6 semester hours in chemistry. Morphology, physiology, classification of microorganisms.
333. **Communicable Diseases (3:3:0)**. Prerequisite: 3 semester hours in microbiology. History, prevalence, etiology, sources and modes of infection, laboratory diagnosis, and methods of control of the principal human diseases.
334. **Bacteriology of Foods and Food Sanitation (3:2:3)**. Prerequisite: 3 semester hours in microbiology. Bacteria and molds in their relation to food spoilage and food sanitation.

430. **Advanced General Bacteriology (3:2:3).** Prerequisite: 12 semester hours in the Department of Biology or Chemistry, and MBIO 231 or 331; prerequisite or parallel: 6 semester hours in chemistry. Advanced and detailed study of microbial morphology, composition, growth, cultivation, variation, and classification. Preparation for advanced studies in microbiology.
431. **Problems in Bacteriology (3:0:9).** Prerequisite: 6 semester hours of microbiology. Selected problems in the various fields of microbiology, according to the needs or interests of the student. May be repeated or taken parallel for full credit in another field or with new materials in the same field.
432. **Immunology and Serology (3:2:3).** Prerequisite: 6 semester hours of microbiology; 10 semester hours of chemistry. Theories of infection and resistance, the production and demonstration of antibodies, the action of antigens, and diagnostic tests.
433. **Physiology of Bacteria (3:2:3).** Prerequisite: 6 semester hours of microbiology; 12 semester hours of chemistry. Chemistry and physiology of bacteria and related microorganisms.
434. **Pathogenic Bacteriology (3:2:3).** Prerequisite: MBIO 430 or 333. Principles of diagnostic microbiology. Laboratory procedures in the isolation and identification of etiological agents.
435. **Taxonomic and Determinative Bacteriology (3:2:3).** Prerequisite: MBIO 430 or consent of instructor. Identification, classification, and nomenclature of bacteria.

FOR GRADUATES

521. **Instrumental Methods of Microbiology (2:0:6).** Prerequisite: Consent of the instructor. Application of instrumental methods to the analysis of physiological phenomena at the cell and cell-free level.
531. **Research in Microbiology (3:0:9).** Prerequisite: MBIO 331, 430, and consent of the instructor. Research problems in selected areas in microbiology. May be taken more than once for credit.
532. **Selected Topics in Microbiology (3:3:0).** Prerequisite: MBIO 331, 430, and consent of instructor. Study of advanced concepts of microbiology. May be taken more than once for credit.
533. **General Virology (3:2:3).** Prerequisite: Consent of the instructor. An introduction to the biology of animal, bacterial, and plant viruses.
631. **Master's Thesis (3).** Enrollment required at least twice.

Courses in Zoology.

FOR UNDERGRADUATES

241. **Comparative Vertebrate Anatomy (4:3:3).** Prerequisite: BIOL 141, 142. Structure and evolution of the vertebrates. Laboratory study of the anatomy of representative vertebrate types.
243. **Human Anatomy and Physiology (4:3:3).** Prerequisite or parallel: 6 semester 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.
336. **Comparative Invertebrate Zoology (3:2:3).** Prerequisite: BIOL 141, 142, or consent of the instructor. Structure, life history, and evolution of the invertebrates. Occasional field trips.
337. **General Ornithology (3:2:3).** Prerequisite: BIOL 141, 142, and junior standing. Emphasis on laboratory and field work in systematics ecology and anatomy of birds. Local and overnight field trips.

FOR UNDERGRADUATES AND GRADUATES

331. **Animal Histology (3:2:4).** Prerequisite: ZOOL 241. The study of normal animal tissues.
332. **Comparative Vertebrate Embryology (3:2:4).** Prerequisite: ZOOL 241. The embryological development of different vertebrates, with emphasis on the chick and the pig.
333. **Parasitology (3:2:3).** Prerequisite: ZOOL 241 or 336. Internal and external parasites, with emphasis on the helminths. Life histories and host relationships.
435. **Cytology (3:2:3).** Prerequisite: BIOL 331 or ZOOL 331 or 332, or junior standing in botany. The cell in evolution and heredity.
437. **Natural History of the Vertebrates (3:2:3).** Prerequisite: BIOL 141, 142, or consent of the instructor. Habits, life history, and ecology of vertebrates. Local fauna will be studied. Local and overnight field trips.
438. **Cellular Physiology (3:2:3).** Prerequisite: 6 semester hours of chemistry and 6 semester hours of biology; or consent of instructor. The basic physiological phenomena common to cells of all living organisms.
439. **Comparative Animal Physiology (3:2:3).** Prerequisite: ZOOL 241; CHEM 141, 142; senior standing in zoology or chemistry; or consent of instructor. A comparison of physiological mechanisms in various animal groups and a consideration of how they have evolved.

FOR GRADUATES

531. **Problems in Zoology (3:0:9).** Prerequisite: Graduate standing in zoology. May be repeated for full credit in another field or with new materials in the same field.
532. **Principles and Methods of Systematic Zoology (3:2:3).** Prerequisite: Consent of instructor. Procedures useful in taxonomic and ecological studies of natural populations.
533. **Herpetology (3:2:3).** Prerequisite: Consent of the instructor. The course will be concerned with the biology of amphibians and reptiles. Stress will be placed on classification, evolution, ecology, and anatomy of the various groups.
534. **Advanced Invertebrate Zoology (3:2:3).** Prerequisite: Consent of the instructor. Emphasis upon selected major groups, particularly terrestrial forms. Written reports on special projects required.
535. **Field Zoology (3:3:0).** Prerequisite: Graduate standing in zoology. Readings, reports, and field work on assigned problems. May be repeated for full credit with new materials. An acceptable written report of the semester's work required.
536. **Mammalogy (3:2:3).** Prerequisite: BIOL 141, 142, ZOOL 241, 437, or consent of the instructor. Classification, distribution, life history, evolution, and the identification of mammals. Field work will be stressed.
537. **Physiological Ecology of the Vertebrates (3:3:0).** Prerequisite: Consent of the instructor. A study of the physiological adaptations of organisms, particularly vertebrates, to their environments.
538. **The Arachnids (3:2:3).** Prerequisite: Consent of the instructor. Emphasis on systematics, morphology, distribution, ecology, and behavior. Field trips required.

5311. **Biology of the Acarina** (3:2:3). Prerequisite: Consent of the instructor. Morphology, ecology, cytology, and behavior of mites.
5313. **Advanced Ornithology** (3:2:3). Prerequisite: Consent of instructor. Selected topics including avian systematics, migration, physiology, ecology, and comparative behavior.
5314. **Zoogeography** (3:3:0). Prerequisite: ZOO 533 and 536 recommended. Study of the geographical distribution of vertebrate animals with special reference to North America. Faunal regions, barriers, dispersal, and the relationship of distribution to the origin of species and intraspecific groups.
5317. **Experimental Embryology** (3:2:3). Prerequisite: ZOO 332; consent of the instructor. A survey of experimental work concerning mechanisms of development.
5318. **Comparative Endocrinology** (3:2:3). Prerequisite: ZOO 241, 331, 438, and consent of the instructor. Hormones as chemical coordinators of bodily functions, integrated control of growth.
5319. **Ichthyology** (3:2:3). Prerequisite: Graduate standing in biology. The classification, evolution, distribution, and ecology of fish.
630. **Master's Report** (3).
631. **Master's Thesis** (3). Enrollment required at least twice.
731. **Research** (3). Prerequisite: Admission to doctoral study and consent of the instructor. May be repeated for credit. Research in areas of current interest.
831. **Doctor's Dissertation** (3). Enrollment required at least four times.

Department of Chemistry

This department supervises the following degree programs: CHEMISTRY, Bachelor of Arts or Bachelor of Science, Master of Science, and Doctor of Philosophy.

The undergraduate student may take courses leading to a Bachelor of Arts or a Bachelor of Science degree. The program leading to a Bachelor of Arts degree offers the greater flexibility in curriculum; a specific curriculum for the Bachelor of Science degree is set forth in the accompanying table. It is highly desirable that the student's accomplishments be of the best quality. Grades of D will not be accepted in more than 20 percent of the hours counted in a major in this department. Not more than one D will be accepted in any two-semester course.

Advanced Standing. The Chemistry Department will permit a student to receive credit in any course in the curriculum if he can demonstrate his proficiency in that area by examination. It will be the responsibility of the student to petition the department chairman for such examination(s) well before he would normally enroll in such course. Forms for this purpose can be procured from the department chairman's office and should be completed and returned to his office prior to August 15 or December 15 of each year.

Teacher Education. Students seeking a provisional certificate with chemistry as a teaching field may satisfy the requirement in chemistry through any one of four degree plans. The courses needed for a B.A. or B.S. major in chemistry provide much more than the minimum of 24 semester hours with at least 12 hours at the advanced level. However, for the B.A. with a major other than chemistry, and for the B.S. in Education, either of the following sequences of courses will be adequate to meet this requirement, since training in four fields of chemistry and 12-14 advanced hours in a total of 24-26 semester hours are provided:

CHEM 141, 142, 241, 341,* and 347, 348

or

CHEM 141, 142, 241, 343,* and 335, 336, 325, 326.

In both sequences, calculus and 8 hours of physics are prerequisite to the physical chemistry courses. Additional requirements for teaching certificates will be found in the Teacher Education section of this catalog.

Chemistry Curriculum, B.S. Degree.

FIRST YEAR

Fall		Spring	
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
*MATH 151, Anal. Geom. & Calc. I	5	*MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet. or		ENG 132, Coll. Rhet. or	
ENG 133, Adv. Comp.	3	ENG 134, Adv. Comp.	3
**PHYS 143, Prin. of Phys. I or		**PHYS 241, Prin. of Phys. II or	
science elective	4	science elective	4
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1

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* Note to all majors and minors in this department. The following special purpose courses do not serve as adequate background for graduate majors and minors in chemistry: CHEM 133, 134, 341, 342, and 343.

SECOND YEAR

Fall		Spring	
CHEM 335, Org. Chem., Lec.	3	CHEM 336, Org. Chem., Lec.	3
CHEM 325, Org. Chem., Lab.	2	CHEM 326, Org. Chem., Lab.	2
*Free elective or		ENG 233, Tech. Writing	3
MATH 235, Anal. Geom. & Calc. III	3	GERM 142, Beg. German	4
GERM 141, Beg. German	4	**Science elective or	
**Science elective or		PHYS 241, Prin. of Phys. II	4
PHYS 143, Prin. of Phys. I	4	P.E., Band, or Basic ROTC	1
P.E., Band, or Basic ROTC	1		17

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THIRD YEAR

Fall		Spring	
CHEM 251, Anal. Chem.	5	CHEM 348, Phys. Chem.	4
CHEM 347, Phys. Chem.	4	CHEM 4312, Instrum. Anal.	3
GERM 233, Scien. Germ.	3	GERM 234, Scien. Germ.	3
***Minor	3	***Minor	3
HIST 231, Hist. of U.S. to 1877	3	Free elective	3
	18	HIST 232, Hist. of U.S. since 1877	3

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FOURTH YEAR

Fall		Spring	
CHEM 420, Chem. Lit. & Sem.	2	ECO 235, Prin. of Eco.	3
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
CHEM 445, Inorg. Chem.	4	****Senior Chem.	3
***Minor	3	***Minor	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
****Senior Chem.	3		15

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* Adequate training in algebra and trigonometry is prerequisite for analytic geometry and calculus. If the student is in doubt about which mathematics courses to take in his first year, he must consult with an adviser in the Chemistry Department.

** Science electives are BIOL 141, 142 and GEOL 143, 144. PHYS 143 and 241 are required in this curriculum.

*** The minor will be chosen in biology, geosciences, mathematics, or physics. If mathematics be chosen, 3 of these hours become optional.

**** Senior chemistry courses to be chosen from the following list: 431 or 432; 438; 436 or 437.

Courses in Chemistry.

FOR UNDERGRADUATES

- 133, 134. **Elementary Chemistry (3:2:3 each)**. Some of the principles and applications of inorganic, organic, and biochemistry. Only for home economics students and applicable to degrees with such majors.
- 141, 142. **General Chemistry (4:3:3 each)**. Prerequisite for all courses in chemistry except 133, 134. A general course in chemistry. Available to all students of the College.
251. **Analytical Chemistry (5:3:6)**. Prerequisite: CHEM 141, 142. Basic course in the theories and techniques of analytical chemical methods. Prerequisite for all higher-numbered courses in analytical chemistry.
- *315, 316. **Organic Chemistry Laboratory (1:0:3 each)**. Prerequisite: CHEM 141, 142. Parallel registration in 335, 336 required. Fundamental techniques of organic chemistry. For chemical engineering majors only.
- *325, 326. **Organic Chemistry Laboratory (2:0:6 each)**. Prerequisite: CHEM 141, 142. Parallel registration in 335, 336 required. Techniques of preparative organic chemistry. For chemistry and premedical majors and other students.
- *335, 336. **Organic Chemistry (3:3:0 each)**. Prerequisite: CHEM 141, 142. Parallel registration in 315, 316 or 325, 326 required. A thorough foundation course in organic chemistry. Prerequisite for all courses in organic chemistry above the junior level.
341. **Introductory Organic Chemistry (4:3:3)**. Prerequisite: CHEM 141, 142. A brief study of the compounds of carbon for students in agriculture, home economics, and other fields who require an introduction to the subject. Not open to majors in chemistry for credit.
342. **Physiological Chemistry (4:3:3)**. Prerequisite: CHEM 341. An elementary course in physiological chemistry. Not open to majors in chemistry for credit.
343. **Introductory Physical Chemistry (4:3:3)**. Prerequisite: CHEM 141, 142, 8 hours of physics, and MATH 151, 152; MATH 235 is recommended. For all students who require an introduction to the subject. Not open to majors in chemistry and chemical engineering for credit.
- *347, 348. **Physical Chemistry (4:3:3 each)**. Prerequisite: CHEM 141, 142, PHYS 143, 241, and MATH 151, 152; MATH 235 is recommended. A thorough foundation course in physical chemistry. Prerequisite for all higher numbered courses in physical and inorganic chemistry.

FOR UNDERGRADUATES AND GRADUATES**

420. **Chemical Literature (2:2:0)**. Prerequisite: Senior standing. Chemical literature, the methods of using it. The study of and reports on specific literature topics.
431. **Qualitative Organic Analysis (3:1:6)**. Prerequisite: CHEM 335, 336, and 315, 316, or 325, 326. Identification of unknowns and the separation and identification of the components of mixtures of organic substances.
432. **Structure and Mechanisms in Organic Chemistry (3:3:0)**. Prerequisite: CHEM 335, 336, and 315, 316, or 325, 326. Organic chemistry at an advanced level. Emphasis on developments in theoretical organic chemistry.

* Can be used by graduate students for minor credit only.

** Normally for graduate minor credit only.

- 436, 437. **Biological Chemistry I and II (3:2:3 each)**. Prerequisite: CHEM 251, 335, 336, 315, 316 or 325, 326. Chemistry of constituents of living systems. Regulation of living processes.
438. **Valency and Molecular Structure (3:3:0)**. Prerequisite: CHEM 347, 348. An introduction to the current theories of atomic and molecular structure and the nature of chemical bonding.
445. **Inorganic Chemistry (4:3:3)**. Prerequisite: CHEM 347, 348. A survey of modern topics in organic chemistry, including coordination compounds, non-aqueous solvents, and the chemistry of the transition elements.
4312. **Instrumental Analytical Methods (3:2:3)**. Prerequisite: CHEM 251, 347, 348. Theories and applications of instrumental methods of chemical analysis.

FOR GRADUATES

- 511, 512. **Seminar (1:1:0 each)**. Prerequisite: Graduate standing in chemistry. Required of all entering graduate students majoring in chemistry.
- 531, 532. **Research (3 each)**. May be repeated for additional credit.
5117. **Selected Topics in Analytical Chemistry (1:1:0)**. Prerequisite: Consent of instructor. Variable credit is achieved by multiple registrations. May be repeated for additional credit.
5301. **Advanced Inorganic Chemistry I (3:3:0)**. Prerequisite: CHEM 445. Principles of coordination chemistry. Structure, bonding, properties, and reactions of complex compounds.
5302. **Advanced Inorganic Chemistry II (3:3:0)**. Prerequisite: CHEM 5301. Reaction mechanisms of inorganic compounds.
5304. **Topics in Inorganic Chemistry (3:3:0)**. Prerequisite: Consent of instructor. Special areas of inorganic chemistry not commonly included in other courses. May be repeated for additional credit.
5314. **Advanced Analytical Chemistry (3)**. Prerequisite: CHEM 251, 347, 348. General principles and special methods of analytical chemistry.
5315. **Spectrographic Analysis I. Emission Spectra (3:2:3)**. Prerequisite: Consent of instructor. PHYS 331 is recommended. Qualitative and quantitative analysis using emission spectra.
5316. **Spectrographic Analysis II. Absorption Spectra (3:2:3)**. Identification of compounds and analysis of mixtures by means of their absorption spectra.
5321. **Advanced Organic Chemistry I (3:3:0)**. Prerequisite: CHEM 335, 336, 325 or 315, 326 or 316. Principles and reactions of organic chemistry, with emphasis on the most recent developments from the current literature.
5322. **Advanced Organic Chemistry II (3:3:0)**. Prerequisite: CHEM 5321. Continuation of CHEM 5321.
5325. **Topics in Organic Chemistry (3:3:0)**. Prerequisite: CHEM 5321. May be repeated for additional credit.
5327. **Physical Organic Chemistry I (3:3:0)**. Prerequisite: CHEM 5321. Properties and reactions of organic compounds and the mechanisms of organic reactions considered from the standpoint of the principles of physical chemistry.
5328. **Physical Organic Chemistry II (3:3:0)**. Prerequisite: CHEM 5327. A continuation of CHEM 5327.
5334. **Topics in Biological Chemistry (3:3:0)**. May be repeated for additional credit.
5335. **Physical Biochemistry (3:3:0)**. Prerequisite: CHEM 347, 348, 436, 437. Application of the principles of physical chemistry to membrane permeabilities, membrane potentials, energy metabolism, properties of large molecules and other such problems.
5342. **Advanced Physical Chemistry (3:3:0)**. Prerequisite: CHEM 347, 348. Modern physical chemistry, primarily from the molecular approach, with numerical problems.
5343. **Quantum Chemistry (3:3:0)**. Prerequisite: CHEM 5342. The application of non-relativistic wave mechanics to problem of chemical structure and reactivity.
5344. **Kinetics of Chemical Reactions (3:3:0)**. Prerequisite: CHEM 347, 348. Kinetics and mechanisms of chemical reactions in homogeneous and heterogeneous systems.
5345. **X-Rays and Crystal Structure (3:3:0)**. Prerequisite: CHEM 347, 348. The determination of crystal structure, chemical properties, and physical properties by X-ray methods.
5346. **Statistical Mechanics for Chemists (3:3:0)**. Prerequisite: CHEM 5342. Statistical mechanics in chemistry applied to both closed and open systems, including thermodynamics, lattices, surfaces, and non-equilibrium conditions.
5347. **Chemical Thermodynamics (3:3:0)**. Prerequisite: CHEM 347, 348. Equilibrium thermodynamics in chemical systems influenced by various physical variables, with an introduction to irreversible thermodynamics.
5348. **Topics in Physical Chemistry (3:3:0)**. Prerequisite: CHEM 347, 348. May be repeated for additional credit.
631. **Master's Thesis (3)**. Enrollment required at least twice.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Department of Classical and Romance Languages

This department supervises the *Bachelor of Arts* degree programs in FRENCH, LATIN, and SPANISH, and the *Master of Arts* programs in FRENCH and SPANISH. The department also participates in the BILINGUAL SECRETARIAL and LATIN AMERICAN AREA STUDIES programs leading to the *Bachelor of Arts* degrees.

An undergraduate major in French or Spanish consists of 33 hours in one language; in Latin, 6 hours of Greek are required as part of the 33 hours. French majors are required to complete the following courses as part of the major program: 330, 331, 332, 430, and 4321. Spanish majors must take 436, 4316, 4317, and either 4326 or 4327; those Spanish majors in the bilingual secretarial program are required to complete 438 in addition.

A minor may be obtained in French, Greek, Italian, Latin, Portuguese, or Spanish. Normally, a minimum of 18 hours in one language is required, including at least 3 hours at the 400 level; however, students who present three or four units of a single foreign language from high school may enter

courses in the 300 series in the same language and complete a 12-hour minor by offering 6 of 300 courses and 6 of 400 courses. This 12-hour minor also fulfills the foreign language requirement for the Bachelor of Arts degree.

Students who wish to major or minor in one of these languages should consult the chairman of the department. At least a C in all language courses numbered 400 is required as well as a C average in the major program.

Courses numbered 131 or 141 suppose no previous study in the language. Students who have had two years (i.e., two units) of one language in high school, and who wish to continue the same language, should enroll for the 231 course. Those who have had three or four years of one language in high school and who wish to continue the same language should enroll for the 330 or 331 course.

To fulfill the general Bachelor of Arts requirement for any major, students must complete 12-14 semester hours in the same language. Courses at the 100 level may not be used to satisfy this requirement if a student has studied the language offered for two or more years in high school. A foreign student who graduated from a secondary school in his native country may not receive credit for a course in his native language which is numbered below 400.

Teacher Education. For purposes of certification, teaching fields are offered in French, Latin, and Spanish. The minimum standard program requires 24 hours of courses numbered 200 and above which must include 9 hours of 400 courses. Students seeking certification in French or Spanish must complete LING 4311 as part of the teaching field.

Courses in Arabic.

FOR UNDERGRADUATES

- 131, 132. **A Beginning Course in Arabic (3:3:0 each).**
231, 232. **A Second Course in Arabic (3:3:0 each).** Prerequisite: ARAB 131 and 132, or the equivalent. Reading, cultural background, conversation, and composition.

Courses in Classics.*

FOR UNDERGRADUATES

131. **Latin and Greek Terminology (3:3:0).** Analysis of English words by study of Latin and Greek roots, prefixes, and suffixes.
132. **Introduction to Classical Mythology (3:3:0).** Classical myths, their significance in the ancient world and influence on modern literature.
231. **Greek Classics in Translation (3:3:0).** Epic, tragedy, comedy, lyric poetry, philosophy, history, oratory, science, and biography in translation.
232. **Latin Classics in Translation (3:3:0).** Comedy, epic, lyric and elegiac poetry, satire, tragedy, philosophy, history and invective in translation.

Courses in French.

FOR UNDERGRADUATES

- 141, 142. **A Beginning Course in French (4:3:2 each).**
231, 232. **A Second Course in French (3:3:0 each).** Prerequisite: FREN 141 and 142, or two units of high school French. Reading, cultural background, conversation, and composition.
330. **French Conversation (3:3:0).** Prerequisite: FREN 231 and 232, or the equivalent. Designed to increase vocabulary and attain oral fluency. May be taken concurrently with 331 or 332. Required of French majors.
331, 332. **French Life and Literature (3:3:0 each).** Prerequisite: FREN 231 and 232, or the equivalent. A survey of French literature; conversation, composition, and grammar review. Required of French majors.

FOR UNDERGRADUATES AND GRADUATES**

430. **Advanced Grammar and Composition (3:3:0).** Review of important grammatical constructions and idioms, with written practice. Required of French majors.
433. **The Novel of the Nineteenth Century I (3:3:0).** The novel from the Romantic to the Naturalistic Movement.
434. **The Novel of the Nineteenth Century II (3:3:0).** The novel from Naturalism to 1914.
435. **The Literature of the Sixteenth Century (3:3:0).** Readings in sixteenth century French literature. May be repeated for credit with consent of instructor.
436. **French Poetry (3:3:0).** Designed to cover readings in French poetry as a genre.
437. **Twentieth Century Novel (3:3:0).** A survey of the novel from Proust to Robbe-Grillet.
438. **Twentieth Century Drama and Poetry (3:3:0).** A survey of poetry from Baudelaire to Char and of drama from Cocteau to Ionesco. May be repeated for credit with consent of instructor.
4311. **The Classical Theater (3:3:0).** A study of the drama from 1636 to 1700.
4312. **Eighteenth Century Literature (3:3:0).** A survey of eighteenth century works including Montesquieu, Diderot, Voltaire, and Rousseau.
4315. **Drama of the Eighteenth and Nineteenth Centuries (3:3:0).** A survey of the major dramatists of this period.

* Courses in Classics do not require prerequisites in Greek or Latin and may not be counted toward the foreign language requirement.

** FREN 331 and 332, or the equivalent, are prerequisites for all courses in the 400 series. All of these courses are conducted in French.

4316. French Classicism (3:3:0). A survey of French seventeenth century prose and poetry.
4321. Phonetics and Diction (3:3:0). Theory and practice of the principles of pronunciation and intonations. Individual laboratory exercises. Required of French majors.

FOR GRADUATES

5312. Studies in French Language and Literature I (3:3:0). Prerequisite: Consent of department chairman. The contents of this course, through concentration on a literary genre, school, or linguistic topic, will vary to meet the needs of the particular group of students. May be repeated for credit.
5313. Studies in French Language and Literature II (3:3:0). Prerequisite: Consent of department chairman. The contents of this course, through concentration on a literary genre, school, or linguistic topic, will vary to meet the needs of the particular group of students. May be repeated for credit.
630. Master's Report (3).
631. Master's Thesis (3). Enrollment required at least twice.

Courses in Greek.

FOR UNDERGRADUATES

- 131, 132. A Beginning Course in Greek (3:3:0 each).
231, 232. A Second Course in Greek (3:3:0 each). Prerequisite: GRK 131 and 132, or the equivalent. One dialogue of Plato and selections from the Iliad or the Odyssey.

FOR UNDERGRADUATES AND GRADUATES

430. Individual Problems in Greek (3). Prerequisite: GRK 231 and 232, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Independent reading under guidance of a staff member.

Courses in Italian.

FOR UNDERGRADUATES

- 131, 132. A Beginning Course in Italian (3:3:0 each).
231, 232. A Second Course in Italian (3:3:0 each). Prerequisite: ITAL 131 and 132, or equivalent. Reading, cultural background, conversation, and composition.

FOR UNDERGRADUATES AND GRADUATES

430. Individual Problems in Italian (3). Prerequisite: ITAL 231 and 232, or the equivalent. Contents will vary to meet the needs of the students. May be repeated for credit with the consent of the instructor. Independent work under guidance of a staff member.
435. Readings in Italian Language and Literature I (3:3:0). Prerequisite: ITAL 231 and 232, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor.
436. Readings in Italian Language and Literature II (3:3:0). Prerequisite: ITAL 231 and 232, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Selected Italian writers.

Courses in Latin.

FOR UNDERGRADUATES

- 131, 132. A Beginning Course in Latin (3:3:0 each).
231, 232. A Second Course in Latin (3:3:0 each). Prerequisite: LAT 131 and 132, or two units of high school Latin. Prose selections and Vergil.
331, 332. Introduction to Latin Life and Literature (3:3:0 each). Prerequisite: LAT 231 and 232, or three or four units of high school Latin. Reading in Cicero and Ovid or Vergil. Prose composition.

FOR UNDERGRADUATES AND GRADUATES

431. Advanced Composition and Grammar Review (3:3:0). Prerequisite: LAT 331 and 332, or the equivalent, or taken concurrently with 331 or 332. Practice in Latin prose composition. Required of Latin majors.
435. Readings in Latin Literature I (3:3:0). Prerequisite: LAT 331 and 332, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Major works of selected Latin historians.
436. Readings in Latin Literature II. (3:3:0). Prerequisite: LAT 331 and 332, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Major works of selected Latin dramatists and poets.

Courses in Portuguese.

FOR UNDERGRADUATES

- 131, 132. A Beginning Course in Portuguese (3:3:0 each).
231, 232. A Second Course in Portuguese (3:3:0 each). Prerequisite: PORT 131 and 132, or the equivalent. Reading, cultural background, conversation, and composition.

FOR UNDERGRADUATES AND GRADUATES

430. Individual Problems in Portuguese (3). Prerequisite: PORT 231 and 232, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Independent work under guidance of a staff member.
435. Readings in Portuguese and Brazilian Language and Literature I (3:3:0). Prerequisite: PORT 231 and 232, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Major works of selected Portuguese and Brazilian writers. Conducted in Portuguese.
436. Readings in Portuguese and Brazilian Language and Literature II (3:3:0). Prerequisite: PORT 231 and 232, or the equivalent. Contents will vary to meet the needs of students. May be repeated for credit with the consent of the instructor. Major works of selected Portuguese and Brazilian writers. Conducted in Portuguese.

Courses in Spanish.

FOR UNDERGRADUATES

- 141, 142. A Beginning Course in Spanish (4:3:2 each).

- 231, 232. **A Second Course in Spanish (3:3:0 each)**. Prerequisite: SPAN 141 and 142, or two units of high school Spanish. Reading, cultural background, conversation, and composition.
- 331, 332. **Masterpieces of the Hispanic World (3:3:0 each)**. Prerequisite: SPAN 231 and 232, or the equivalent. History, geography, literary masterpieces, and customs of Spain and Spanish America. Grammar review, composition, and conversation based on readings. Conducted in Spanish.

FOR UNDERGRADUATES AND GRADUATES*

431. **Nineteenth Century Prose (3:3:0)**. The novel and the essay of the periods of Romanticism and of Realism.
432. **Nineteenth Century Prose (3:3:0)**. The novel and the short story from the Naturalistic Movement to and including the Generation of 1898.
433. **Modern Drama and Poetry (3:3:0)**. The romantic and social drama, some of the poetry of Garcia Gutierrez, Duque de Rivas, and Zorrilla.
434. **Modern Drama and Poetry (3:3:0)**. The Realistic Movement in the drama from Benavente to World War I.
436. **Advanced Composition and Conversation (3:3:0)**. May be taken concurrently with 331 or 332. Written and oral Spanish. Required of Spanish majors.
438. **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. Required of majors in the Spanish bilingual secretarial program.
4312. **The Prose of the Golden Age (3:3:0)**. The important prose writers from 1499 to 1650.
4313. **The Prose of the Golden Age (3:3:0)**. Cervantes and his "Don Quixote."
4314. **The Drama of the Golden Age (3:3:0)**. Reading of representative plays of the seventeenth century, including works of Lope de Vega, Tirso de Molina, Guillen de Castro, and Mira de Amescua.
4315. **The Drama of the Golden Age (3:3:0)**. Reading of representative plays of the seventeenth century, including works of Ruiz de Alarcón, Calderón, Rojas Zorrilla, and Moreto.
4316. **A Survey of Spanish Literature (3:3:0)**. The history of Spanish literature in the Middle Ages and Renaissance. Required of Spanish majors.
4317. **A Survey of Spanish Literature (3:3:0)**. The history of Spanish literature from the eighteenth through the twentieth century. Required of Spanish majors.
4318. **Readings in Contemporary Spanish Literature (3:3:0)**. A survey of the literary scene in Spain from 1898 to the present.
4319. **Readings in Contemporary Spanish Literature (3:3:0)**. A survey of the literary scene in Spain from 1898 to the present.
4321. **The Latin American Novel I (3:3:0)**. A survey of the novel of Latin America to the end of the nineteenth century.
4322. **The Latin American Novel II (3:3:0)**. A survey of the novel of Latin America from the period of the Mexican Revolution to the present.
4323. **The Latin American Short Story (3:3:0)**. The rise and development of the Latin American short story from the period of Independence to the present.
4324. **Readings in Spanish American Literature and Civilization (3:3:0)**. The content of this course will vary to meet the needs of the students. May be repeated for credit with the consent of the instructor.
4325. **Readings in Spanish American Literature and Civilization (3:3:0)**. The contents of this course will vary to meet the needs of the students. May be repeated for credit with the consent of the instructor.
4326. **Survey of Spanish American Literature (3:3:0)**. The history of Spanish American literature from colonial days to the Modernist Movement. Spanish majors must take either 4326 or 4327.
4327. **Survey of Spanish American Literature (3:3:0)**. The history of Spanish American literature from the Modernist Movement to the present. Spanish majors must take either 4326 or 4327.
- 4328, 4329. **Spanish Civilization (3:3:0)**. Prerequisite: SPAN 436, or the equivalent, and consent of the instructor. A study of the various phases of pre-Hispanic and Spanish civilizations in Mexico; history, arts, language, literature, and customs. Offered in Mexico each summer.

FOR GRADUATES

- 541, 542. **Summer Language Institute (4:21:25 each)**. Prerequisite: Graduate standing and permission of the instructor. Advanced study of the area, civilization, language, and culture. Applied linguistics and methodology. Investigations, field work, reports.
5312. **Studies in Spanish and Spanish American Literature (3:3:0)**. Prerequisite: Consent of department chairman. The nature and content of this course will vary to meet the needs of individual students. Credit given as often as course is repeated.
5313. **Studies in Spanish and Spanish American Literature (3:3:0)**. Prerequisite: Consent of department chairman. The nature and content of this course will vary to meet the needs of individual students. Credit given as often as course is repeated.
630. **Master's Report (3)**.
631. **Master's Thesis (3)**. Enrollment required at least twice.

Courses in Linguistics.

FOR UNDERGRADUATES AND GRADUATES

4311. **Applied Linguistics for Modern Foreign Languages (3:3:0)**. Prerequisite: FREN, GERM, or SPAN 331 and 332, and 6 semester hours of education. Instruction in linguistic analysis as related to the teaching of foreign languages. Required of majors and minors seeking teacher certification.

FOR GRADUATES

530. **Romance Linguistics (3:3:0)**. Prerequisite: Consent of department chairman. Origin and history of the Romance languages; emphasis on the main traits of phonology, morphology, and syntax.

* SPAN 331 and 332, or the equivalent, are prerequisites for all courses in the 400 series. All of these courses are conducted in Spanish.

5311. **Linguistic Techniques in Teaching Romance Languages (3:3:0).** Prerequisite: Consent of department chairman. Study of language teaching materials. Linguistic analysis and preparation of drills based on current texts.
5335. **Spanish and English as Second Languages in the Elementary School (3:3:0).** Prerequisite: As a part of the composite minor or for credit in education, no prerequisites are necessary; a student who wishes to apply this course toward a major or minor in Spanish must have completed SPAN 331 and 332 or the equivalent. The linguistic basis for the teaching of Spanish and English as second languages to elementary school children.

Department of English

This department supervises the following degree programs in ENGLISH: *Bachelor of Arts, Master of Arts, Doctor of Philosophy.*

Through the sponsorship of the local chapter of Sigma Tau Delta, national English honorary, and the Graduate English Club, awards are presented annually for the best freshman essay, for the highest scholastic average in English of a graduating senior English major, and for the most outstanding master's thesis. In addition, prizes in creative writing are offered, and the winning entries are published in the *Harbinger*, department literary magazine.

English majors should report to the department chairman or the chairman of undergraduate studies in English to be assigned a major professor for academic advisement. ENG 131, 132, or 133, 134 (see "Special Provisions for Entering Freshmen," below) and 231, 232, are prerequisites for all English major or minor programs for the B.A. degree. Majors must offer for graduation a minimum of 21 hours in English above the freshman-sophomore level. The program will include:

- A. At least one course from each of the following:
 - I. English literature before 1700: 300, 333, 335, 3314, 433, 434, 4331, 336H, 431H
 - II. English literature after 1700: 338, 339, 3315, 3322, 3327, 4337
 - III. American literature: 3323, 3324, 3325, 3326, 3329, 4341, 4343, 337H, 432H
 - IV. Comparative literature, language, linguistics: 331, 332, 334, 3337, 3338, 438, 439, 4332, 4333, 4336, 4338, 4343, 4344, 4345, 4349, 4355
- B. A concentration of two additional courses in one of the four groups listed above.
- C. One additional course selected from the four groups.

English minors must offer 18 hours, including at least 6 hours of advanced work. For electives, students who have completed their degree requirements in English may select any 300- or 400-level course. To receive credit toward graduation, a student who is an English major or minor must receive at least a C on all advanced courses in English.

Special Provisions for Entering Freshmen. Six hours of freshman English (131, 132 or 133, 134) are prerequisites for all sophomore courses (231, 232, 233) except under the advanced placement conditions described in the Admissions section of this catalog.

Honors Work in English. The Department of English fully participates in the Honors Program in the School of Arts and Sciences, and offers, in addition to ENG 133, 134, special honors sections of ENG 231 and 232; ENG 336H, 337H (Junior Honors Seminar); and ENG 431H, 432H (Senior Honors Seminar). The Senior Honors Seminar includes an oral comprehensive examination and the writing of an Honors thesis.

Teacher Education. 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. The grade of C on all advanced courses is a minimum requirement. Students seeking certification with the degree of Bachelor of Arts will consult with the chairman of undergraduate studies; students seeking certification in English with the Bachelor of Science in Education will consult with the chairman of teacher certification in English.

For the English major seeking the degree of Bachelor of Arts and teacher certification on the secondary level, the program will include seven advanced courses as follows:

- A. At least one course from each of the following:
 - I. English literature before 1700: 330, 333, 335, 3314, 336H, 433, 434, 4331, 431H
 - II. English literature after 1700: 338, 339, 3315, 3322, 3327, 4337

III. Comparative literature, literary criticism, methods: 331, 332, 334, 4332, 4333, 4336, 4343, 4344, 4345, 4349, 4355

IV. Language: 3337, 3338, 438, 439, 4338

B. At least two courses from the following: 3323, 3324, 3325, 3326, 3329, 3341, 4341, 4343, 337H, 432H

C. One additional course from the groups listed under A or B above.

For students seeking the degree of Bachelor of Arts with a major other than English but who wish to be certified to teach English on the secondary level, the program will include six advanced courses as follows:

A. At least one course from each of the following:

I. English literature before 1700: 330, 333, 335, 3314

II. English literature after 1700: 338, 339, 3315, 3322

III. Language: 3337, 3338, 438, 439, 4338

IV. Comparative literature, literary criticism, methods: 331, 332, 4332, 4333, 4336, 4343, 4344, 4345, 4349, 4355

B. One course from the following: 3323, 3324

C. One course from the following (a student may elect to take both courses under B above and omit C): 3325, 3326, 3329, 3341, 4341, 4343, 337H, 432H

For the student seeking the degree of Bachelor of Science in Education with certification to teach English on the secondary level, the program will include six advanced courses as follows:

A. At least one course from each of the following:

I. English literature before 1700: 330, 333, 335, 3314

II. English literature after 1700: 338, 339, 3315, 3322

III. Language: 3337, 3338, 438, 439, 4338

IV. Comparative literature, literary criticism, methods: 331, 332, 4332, 4333, 4336, 4343, 4344, 4345, 4349, 4355

B. One course from the following: 3323, 3324

C. One course from the following (a student may elect to take both courses under B above and omit C): 3325, 3326, 3329, 3341, 4341, 4343, 337H, 432H

For students seeking the degree of Bachelor of Arts with a major in English and with certification to teach on the elementary level, the program will include the following:

A. Completion of the requirements for the degree of Bachelor of Arts with a major in English.

B. Completion of courses and requirements in professional education as described in the section on Teacher Education in this catalog.

C. Completion of specific courses under Plan I or Plan II (selected from those contained in the program for an English major) as follows:

Plan I. English Specialization. One course required from each of the following groups:

1. 3323, 3324, 3329

2. 3337, 3338, 438, 439, 4338

3. 4337, 4349

Plan II. English Specialization. One course required from each of the following groups:

1. 335, 3314

2. 3323, 3324, 3329

3. 3337, 3338, 438, 439

4. 4337, 4349

Students seeking the degree of Bachelor of Science in Education with elementary certification in English may elect either Plan I or Plan II as follows:

Plan I. English Specialization. One course required from each of the following groups:

1. 3323, 3324, 3329

2. 3337, 3338, 438, 439

3. 4337, 4349

Plan II. English Specialization. One course required from each of the following groups:

1. 335, 3314

2. 3323, 3324, 3329

3. 338, 3337, 438, 439

4. 4337, 4349

NOTE: Substitutions of English courses in any certification plan described above may be made only with the permission of the Department of English.

Courses in English.

FOR UNDERGRADUATES

- 131, 132. **College Rhetoric (3:3:0 each)**. Training in correct and effective writing and in efficient, accurate reading.
- 133, 134. **Advanced Composition and Literature for Freshmen (3:3:0 each)**. An honors-level course designed for those who demonstrate competence in English composition as measured by the College Board Examination.
- 231, 232. **Masterpieces of Literature (3:3:0 each)**. 231: Representative works of Greek dramatists, Chaucer, Shakespeare, and Milton. 232: Six or eight masterpieces selected from the works of writers of the eighteenth, nineteenth, and twentieth centuries.
233. **Technical Writing (3:3:0)**. Preparation of oral and written reports in scientific and technical fields.
330. **Early English Literature: "Beowulf" through Malory (3:3:0)**.
331. **Short Story (3:3:0)**. The short story as a literary form.
332. **Introduction to Literary Criticism (3:3:0)**. Theories and traditions of literary criticism.
333. **English Literature of the Seventeenth Century (3:3:0)**.
334. **Creative and Professional Writing (3:3:0)**. Prerequisite: B or better in freshman English.
335. **Shakespeare (3:3:0)**. Offered each semester of long session. The content in the second semester will in no way duplicate that of the first. May be repeated once for credit with the permission of department.
- 336H. **Junior Honors Seminar (3:3:0)**. Honors Studies in English literature.
- 337H. **Junior Honors Seminar (3:3:0)**. Honors studies in American literature.
338. **English Literature of the Eighteenth Century (3:3:0)**.
339. **English Romanticism (3:3:0)**.
3314. **Literature of the English Renaissance (3:3:0)**. Poetry and prose from 1500 to 1603.
3315. **The Victorians (3:3:0)**. English poetry and prose of the Victorian era.
3322. **British Literature of the Twentieth Century (3:3:0)**.
3323. **American Literature and its Backgrounds (3:3:0)**. American literature from its beginnings through Whitman.
3324. **American Literature and its Backgrounds (3:3:0)**. American literature from the advent of realism to the present.
3325. **American Novel (3:3:0)**. Representative works of major American novelists.
3326. **American Literature of the Twentieth Century (3:3:0)**.
3327. **English Novel (3:3:0)**. Representative works of major English novelists.
3329. **Major American Poets (3:3:0)**. Introduction to American poetic traditions through a study of representative works of major American poets.
3337. **Advanced Grammar (3:3:0)**.
3338. **Introduction to Linguistic Science (3:3:0)**.
3341. **Survey of American Folklore (3:3:0)**.
- 431H, 432H. **Senior Honors Seminar (3:3:0 each)**.

FOR UNDERGRADUATES AND GRADUATES*

433. **Chaucer (3:3:0)**. Chaucer's works and career, with emphasis upon "The Canterbury Tales," "Troilus and Criseyde," and selected minor poems.
434. **Milton and His Age (3:3:0)**. Milton's poetry and prose.
438. **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.
439. **American English (3:3:0)**. History, characteristics, and dialects of the English language in America.
4331. **Pre-Shakespearean Drama (3:3:0)**. From the beginnings of English drama through Marlowe.
4332. **History of Literary Criticism (3:3:0)**.
4333. **Philosophical Ideas in Literature (3:3:0)**. The evolution of philosophical ideas in English and American literature. May be repeated once for credit with permission of department.
4336. **Teaching English in Secondary Schools (3:3:0)**.
4337. **English Literary History: A Synthesis (3:3:0)**. A comprehensive view of English literature from fourteenth through the twentieth centuries, in English translations.
4338. **Exposition for Advanced Students (3:3:0)**.
4341. **Regional Literature of the United States (3:3:0)**. Topics: Southwestern, Southern, and other regional literatures of the United States.
4343. **Modern American and European Drama (3:3:0)**. Representative modern plays. Topics: continental and British drama from Ibsen, Wilde, and Shaw to the present; American drama of the twentieth century. May be repeated once for credit with permission of department as topics vary.
4344. **Comparative Literature (3:3:0)**. Comparative themes and motifs in the history of ideas.
4345. **Comparative Literature (3:3:0)**. Comparative studies in types and genres.
4349. **Ancient and Medieval Literature (3:3:0)**. Representative literature, ancient and medieval, in English translations.
4355. **Modern Continental Literature (3:3:0)**. Representative literature of continental Europe from fourteenth through the twentieth centuries, in English translations.

FOR GRADUATES**

530. **Studies in Medieval Literature (3:3:0)**.
531. **Studies in Comparative Literature (3:3:0)**.
532. **Teaching of College English (3:3:0)**.
533. **Studies in Renaissance Literature (3:3:0)**.
534. **Old English (3:3:0)**.
535. **Studies in Early Victorian Literature (3:3:0)**.

* Normally credit for graduate minors only.

** Graduate courses may be repeated for credit with permission of department as topics vary.

538. Studies in Early English Romantics (3:3:0).
 539. Studies in the Neo-Classical Age (3:3:0).
 5311. Studies in Seventeenth Century Literature (3:3:0).
 5312. Studies in Drama (3:3:0).
 5313. Studies in Modern European Literature (3:3:0).
 5314. Studies in Literary Criticism (3:3:0).
 5315. Studies in Folklore (3:3:0).
 5318. Studies in Eighteenth Century American Literature (3:3:0).
 5319. Studies in Shakespeare (3:3:0).
 5322. Studies in Modern British Literature (3:3:0).
 5323. Studies in Nineteenth Century American Literature (3:3:0).
 5324. Studies in Twentieth Century American Literature (3:3:0).
 5325. American Novel to 1900 (3:3:0).
 5326. American Novel since 1900 (3:3:0).
 5329. Studies in Modern Poetry (3:3:0).
 5335. Principles of Language (3:3:0).
 5337. Studies in Linguistics (3:3:0).
 5338. Linguistic Analysis I: Syntax (3:3:0). Prerequisite: ENG 3338 or 5335.
 5339. Linguistic Analysis II: Phonology (3:3:0). Prerequisite: ENG 5338 or consent of instructor.
 5341. Studies in Bibliography (3:3:0).
 5351. Studies in Later Victorian Literature (3:3:0).
 5381. Studies in Later English Romantics (3:3:0).
 5391. Studies in the Age of Johnson (3:3:0).
 630. Master's Report (3).
 631. Master's Thesis (3). Enrollment required at least twice.
 731, 732. Research (3 each).
 831. Doctor's Dissertation (3). Enrollment required at least four times.

Department of Geosciences

This department supervises the following degree programs: *GEOCHEMISTRY, Bachelor of Science*; *GEOGRAPHY, Bachelor of Arts*; *GEOLOGY, Bachelor of Arts or Bachelor of Science, Master of Science, Doctor of Philosophy*; *GEOPHYSICS, Bachelor of Science*. Options for specialization in the undergraduate geology program are as follows: General Geology Option, Paleontology Option, and Ground Water Option.

The program leading to the Bachelor of Arts degree in general geology is designed to provide a broad liberal arts background and basic training in the principles of geology; the programs leading to the degree of Bachelor of Science provide more intensive training in the geosciences and related disciplines.

GEOL 143, 144, 241, 242, 331, 332, 335, 336, 363 and CHEM 141, 142 are required courses in the geology Bachelor of Arts degree program. Specific requirements of the Bachelor of Science degree programs are given in the curriculum tables. A two-year course of study in a foreign language is required in all degree programs.

The Bachelor of Arts degree program in geography requires completion of 30 semester hours of geography; individual programs are developed through conferences with the adviser.

A minor is required in all programs. The minor field for the Bachelor of Arts programs can be selected from a wide range of disciplines; the minor for a Bachelor of Science degree program must be in biology, chemistry, mathematics, or physics.

Grades below C in required courses of either the major or minor of a geoscience degree program are not accepted by the department in fulfillment of the degree requirements. Grades below C are not accepted in fulfillment of a minor in the geosciences.

Geochemistry Curriculum, B.S. Degree.

FIRST YEAR

Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
GEOL 143, Phys. Geol.	4	GEOL 144, Hist. Geol.	4
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
	17		17

SECOND YEAR

Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
CHEM 241, Anal. Chem.	4	CHEM 242, Anal. Chem.	4
GEOL 241, Mineral. & Petro.	4	GEOL 242, Mineral. & Petro.	4
MATH 235, Anal. Geom. & Calc. I	3	GERM 142, Beg. German	4
GERM 141, Beg. German	4	Elective	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	19-20		19-20

THIRD YEAR			
Fall		Spring	
GEOL 331, Geomorphology	3	GEOL 332, Struct. Geol.	3
CHEM 347, Phys. Chem.	4	CHEM 348, Phys. Chem.	4
PHYS 141, Gen. Phys.	4	PHYS 142, Gen. Phys.	4
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
GERM 233, Scien. German	3	GERM 234, Scien. German	3
		17	

SUMMER SESSION
(Following Junior Year)

GEOL 363, Field Geol. 6

FOURTH YEAR			
Fall		Spring	
GEOL 431, Opt. Mineral. & Petro.	3	GEOL 432, Opt. Mineral. & Petro.	3
G CH 4331, Geochem. I	3	G CH 4332, Geochem. II	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
Science elective	3	Science elective	3
Elective	3	Elective	3
		15	

Geology Curriculum, B.S. Degree.

FIRST YEAR			
Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
GEOL 143, Phys. Geol.	4	GEOL 144, Hist. Geol.	4
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
		17	

SECOND YEAR			
Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
PHYS 141, Gen. Phys.	4	PHYS 142, Gen. Phys.	4
GEOL 241, Mineral. & Petro.	4	GEOL 242, Mineral. & Petro.	4
Foreign Language 141	4	Foreign Language 142	4
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
		16-17	

SUMMER SESSION
(Following Junior Year)

GEOL 363, Field Geology 6

THIRD YEAR			
Fall		Spring	
GEOL 331, Geomorphology	3	GEOL 332, Struct. Geol.	3
GEOL 335, Paleontology	3	GEOL 336, Paleontology	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
Foreign Language 231	3	Foreign Language 232	3
Electives	6	Electives	6
		18	

FOURTH YEAR			
Fall		Spring	
GEOL 4314, Stratigraphy	3	GEOL 432, Opt. Mineral. & Petro.	3
GEOL 431, Opt. Mineral. & Petro.	3	GEOL 4315, Stratigraphy	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
Electives	6	Electives	6
		15	

Geology Major, Paleontology Curriculum, B.S. Degree.

FIRST YEAR			
Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
GEOL 143, Phys. Geol.	4	GEOL 144, Hist. Geol.	4
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
		17	

SECOND YEAR			
Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
BIOL 141, Botany	4	BIOL 142, Zoology	4
GEOL 241, Mineral. & Petro.	4	GEOL 242, Mineral. & Petro.	4
Foreign Language 141	4	Elective	3
P.E., Band, or Basic ROTC	1-2	Foreign Language 142	4
		P.E., Band, or Basic ROTC	1-2
		16-17	

THIRD YEAR

Fall		Spring	
GEOL 331, Geomorphology	3	GEOL 332, Struct. Geol.	3
GEOL 335, Paleontology	3	GEOL 336, Paleontology	3
BIOL 333, Bio-ecology	3	ZOOL 336, Comp. Invert. Zool.	3
Foreign Language 231	3	Foreign Language 232	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
Elective	3	Elective	3
<hr/>		<hr/>	
18		18	

SUMMER SESSION
 (Following Junior Year)

GEOL 363, Field Geology 6

FOURTH YEAR

Fall		Spring	
GEOL 4314, Stratigraphy	3	GEOL 4315, Stratigraphy	3
GEOL 436, Micropaleontology	3	GEOL 435, Strat. Paleol.	3
Biology or Zoology	3	Biology or Zoology	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
Elective	3	Elective	3
<hr/>		<hr/>	
15		15	

Geology Major, Ground Water Curriculum, B.S. Degree.**FIRST YEAR**

Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
GEOL 143, Phys. Geol.	4	GEOL 144, Hist. Geol.	4
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
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17		17	

SECOND YEAR

Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
PHYS 141, Gen. Phys.	4	PHYS 142, Gen. Phys.	4
GEOL 241, Mineral. & Petro.	4	GEOL 242, Mineral. & Petro.	4
MATH 235, Anal. Geom. & Calc. III	3	Foreign Language 142	4
Foreign Language 141	4	P.E., Band, or Basic ROTC	1-2
P.E., Band, or Basic ROTC	1-2		
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19-20		16-17	

THIRD YEAR

Fall		Spring	
GEOL 331, Geomorphology	3	GEOL 332, Struct. Geol.	3
GEOL 335, Paleontology	3	GEOL 336, Paleontology	3
C E 233, Statics	3	C E 3351, Mech. of Fluids	3
MATH 332, Diff. Equat. I	3	GEOL 337, Ground Water	3
Foreign Language 231	3	Foreign Language 232	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
<hr/>		<hr/>	
18		18	

SUMMER SESSION
 (Following Junior Year)

GEOL 363, Field Geology 6

FOURTH YEAR

Fall		Spring	
GEOL 4314, Stratigraphy	3	GEOL 4315, Stratigraphy	3
GEOL 431, Opt. Mineral. & Petro.	3	GEOL 432, Opt. Mineral. & Petro.	3
C E 4355, Ground Water Hydrol.	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3	Electives	6
Elective	3		
<hr/>		<hr/>	
15		15	

Geophysics Curriculum, B.S. Degree.**FIRST YEAR**

Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
GEOL 143, Phys. Geol.	4	GEOL 145, Phys. Geosci.	4
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
HIST 231, Hist. of U.S. to 1877	3	PHYS 143, Prin. of Phys.	4
GOVT 231, Amer. Govt., Org.	3	P.E., Band, or Basic ROTC	1
P.E., Band, or Basic ROTC	1		
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19		17	

SECOND YEAR			
Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
HIST 232, Hist. of U.S. since 1877	3	GEOL 332, Struct. Geol.	3
Elective	3	Elective	3
MATH 235, Anal. Geom. & Calc. III	3	GOVT 232, Amer. Govt., Funct.	3
PHYS 241, Prin. of Phys.	4	PHYS 242, Prin. of Phys.	4
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
<hr/>		<hr/>	
17-18		17-18	

THIRD YEAR			
Fall		Spring	
PHYS 335, Elec. & Magnetism	3	PHYS 341, Electronics	4
CHEM 141, Gen. Chem.	4	PHYS 336, Elec. & Magnetism	3
Foreign Language 141	4	CHEM 142, Gen. Chem.	4
Electives	6	Foreign Language 142	4
<hr/>		Elective	3
17		<hr/>	
		18	

SUMMER SESSION
(Following Junior Year)

GEOL 363, Field Geology 6

FOURTH YEAR			
Fall		Spring	
MATH 335, Higher Math. for Engrs. & Scits. I	3	MATH 336, Higher Math. for Engrs. & Scits. II	3
PHYS 434, Mechanics	3	PHYS 435, Mechanics	3
Foreign Language 231	3	Foreign Language 232	3
G PH 3321, Geophys. Meth.	3	G PH 3322, Geophys. Meth.	3
G PH 4321, Earth Seis.	3	G PH 4322, Earth's Grav. Field	3
<hr/>		G PH 4323, Appl. of Geophys.	3
15		<hr/>	
		18	

Courses in Geochemistry.

FOR UNDERGRADUATES AND GRADUATES

4331. **Geochemistry I (3:3:0).** Prerequisite: GEOL 241, 242 and CHEM 347, 348. Consideration of principles of geochemistry and of the distribution of the elements in the earth.
4332. **Geochemistry II (3:3:0).** Prerequisite: Geochemistry I. Continuation of Geochemistry I.

FOR GRADUATES

533. **Selected Topics in Geochemistry (3:3:0).** Prerequisite: G CH 4331 and 4332. Topics selected by the instructor to fit the needs or interests of the class. May be repeated for credit.
534. **Advanced Problems in Geochemistry (3:1:6).** Prerequisite: G CH 4331 and 4332. Individual research on selected problems. A formal scientific report is required. May be repeated for credit.

Courses in Geography.

FOR UNDERGRADUATES

1451. **Introduction to Geography (4:3:2).**
1452. **Weather and Climate (4:3:2).**
2351. **Regional Geography of the World (3:3:0).**
2352. **Geography of the United States and Canada (3:3:0).**
331. **General Meteorology (3:2:3).**
3251. **Cartography and Graphics (2:1:3).**
3355. **Field Methods (3:2:3).**

FOR UNDERGRADUATES AND GRADUATES

4351. **Land Use Planning (3:3:0).**
4352. **Urban Geography (3:3:0).**
4353. **Conservation of Natural Resources (3:3:0).**
4355. **Geography of Texas (3:3:0).**
4356. **Geography of the American Southwest (3:3:0).**
4361. **Geography of Europe (3:3:0).**
4362. **Geography of the Union of Soviet Socialist Republics (3:3:0).**
4363. **Geography of South America (3:3:0).**
4364. **Geography of Mexico and the Caribbean Lands (3:3:0).**

Courses in Geology.

FOR UNDERGRADUATES

143. **Physical Geology (4:3:2).** An introductory study of geologic features and processes.
144. **Historical Geology (4:3:2).** Prerequisite: GEOL 143. An introductory study of the earth's geologic history.
145. **Physical Geoscience (4:3:2).** Prerequisite: GEOL 143. A continuation of GEOL 143; basic theories and problems of physical geology and geophysics are discussed in greater detail than in the introductory course.
233. **General Geology for Engineers (3:2:3).** A general introduction to the principles of geology and their application to the field of engineering other than petroleum engineering. Not applicable to a degree in geology.
241. **Mineralogy and Petrography I (4:2:6).** Prerequisite: GEOL 143 and CHEM 141, 142.
242. **Mineralogy and Petrography II. (4:2:6).** Prerequisite: GEOL 241.
331. **Geomorphology (3:2:3).** Prerequisite: GEOL 143, 144 or 145 and approval of the instructor.
332. **Structural Geology (3:2:3).** Prerequisite: GEOL 143, 144 or 145 and approval of the instructor.
- 335, 336. **General Paleontology I, II (3:2:3 each).** Prerequisite: GEOL 143, 144 and approval of instructor.

337. Ground Water (3:3:0). Prerequisite: GEOL 241, 242, 331 and approval of the instructor.
 363. Field Geology (6). Prerequisite: GEOL 143, 144, 241, 242, 331, 332, and approval of instructor. Summer sessions only.

FOR UNDERGRADUATES AND GRADUATES

- 431, 432. Optical Mineralogy and Petrology (3:1:6 each). Prerequisite: GEOL 241, 242, and approval of instructor.
 433. Petroleum Geology I (3:3:0). Prerequisite: GEOL 332, PHYS 141, 142 or 235, 236 and approval of instructor.
 434. Petroleum Geology II (3:2:3). Prerequisite: GEOL 433 and approval of instructor.
 435. Stratigraphic Paleontology (3:2:3). Prerequisite: GEOL 335, 336, 4314 and approval of the instructor.
 436. Micropaleontology (3:1:6). Prerequisite: GEOL 335, 336 and approval of instructor.
 437. Sedimentation I (3:2:3). Prerequisite: GEOL 241, 242, 331, 332 and approval of the instructor. Sedimentary processes and environments.
 438. Sedimentation II (3:2:3). Prerequisite: GEOL 437 and approval of instructor. Analytical techniques for the study of sedimentary rocks.
 439. Vertebrate Paleontology (3:2:3). Prerequisite: Advanced standing in a natural science and approval of the instructor. A general survey of the history and development of the vertebrata, with special emphasis on the fossil record. Basic principles of paleontologic methods, including techniques of collecting, preservation, identification, and interpretation.
 4313. Lunar and Planetary Science (3:3:0).
 4314. Principles of Stratigraphy (3:3:0). Prerequisite: GEOL 241, 242, 335, 336 and approval of the instructor.
 4315. Paleozoic, Mesozoic, Cenozoic Stratigraphy (3:3:0). Prerequisite: GEOL 4314 and approval of the instructor.
 4316. Aerial Photo Interpretation (3:2:3). Prerequisite: GEOL 331, 332 and consent of the instructor.

FOR GRADUATES

511. Seminar (1:1:0).
 521. Clay Mineralogy (2:1:3). Prerequisite: Graduate standing and consent of the instructor.
 531. Advanced Physical Geology (3:3:0).
 532. Advanced Historical Geology (3:3:0). Prerequisite: Graduate standing.
 533. Petrology of Igneous Rocks (3:3:0). Prerequisite: GEOL 431, 432 and a minimum of two years of chemistry.
 534. Petrology of Metamorphic Rocks (3:3:0). Prerequisite: GEOL 431, 432 and a minimum of two years of chemistry.
 535, 536. Advanced Work in Specific Fields (3 each). Prerequisite: Consent of department chairman. Conferences or research courses based on subject matter that is selected to fit the interest of each student. May be repeated for credit.
 538. Geology of the Southwest (3:3:0). Prerequisite: Graduate standing and approval of the instructor.
 541. X-Ray Diffraction and Analysis (4:3:3). Prerequisite: GEOL 241, 242 and CHEM 347, 348.
 542. X-Ray Crystallography (4:3:3). Prerequisite: GEOL 541. Continuation of GEOL 541.
 563. Advanced Field Geology (6). Prerequisite: GEOL 363. Solution of advanced field problems.
 5311. Stratigraphic Micropaleontology (3:2:3). Prerequisite: GEOL 436 and approval of instructor.
 5312. Economic Geology (3:2:3). Prerequisite: GEOL 431, 432 and approval of instructor.
 5313. Applications of Geology in Engineering Projects (3:2:3). Prerequisite: General geology and approval of instructor, graduate standing.
 5324. Advanced Sedimentation (3:2:3). Prerequisite: GEOL 437 or approval of instructor.
 5327. Problems in Paleontology (3:2:3). Prerequisite: GEOL 335, 336 and 4314.
 5328. Advanced Structural Geology (3:2:3). Prerequisite: GEOL 332.
 631. Master's Thesis (3). Two enrollments required for completion of master's degree.
 731, 732. Research (3 each). Required of all doctoral candidates.
 831. Doctor's Dissertation (3). A minimum of four enrollments is required.

Courses in Geophysics.

FOR UNDERGRADUATES

3321. Geophysical Methods, Gravity and Magnetic (3:3:0). Prerequisite: GEOL 143, 144 or 145, 332, MATH 231, 232, PHYS 141, 142, and approval of instructor.
 3322. Geophysical Methods, Seismic and Electrical (3:3:0). Prerequisite: GEOL 143, 144, or 145, 332, MATH 231, 232, and PHYS 141, 142; approval of instructor.

FOR UNDERGRADUATES AND GRADUATES

4321. Earthquake Seismology (3:2:3). Prerequisite: GPH 3322. Observatory functions. Interpretations of earth structures from earthquake seismological data.
 4322. The Earth's Gravity Field (3:3:0). Prerequisite: Consent of instructor. Study of the earth's gravity field in relation to isostasy, geology, and earth structure.
 4323. Applications in Geophysics (3:1:6). Prerequisite: Consent of instructor. Geophysical methods applied to the solution of selected field problems.
 531. Wave Propagation in Layered Media (3:3:0). Prerequisite: Working knowledge of advanced calculus and consent of the instructor. Study of wave propagation in the atmosphere, hydrosphere, and lithosphere.
 533. Selected Topics in Geophysics (3:3:0). Prerequisite: Consent of instructor. Topics, based on the student's requirements and interests, will be selected by the instructor.
 534. Advanced Problems in Geophysics (3:1:6). Prerequisite: Consent of the instructor. Individual research into selected topics of geophysics. A formal scientific report is required. May be repeated for credit.

Department of Germanic and Slavonic Languages

This department supervises the *Bachelor of Arts* and *Master of Arts* programs in GERMAN. In addition, the department participates in the BILINGUAL SECRETARIAL program leading to the *Bachelor of Arts* degree.

For an undergraduate major in German, 33 hours in that language are required. A minor may be obtained in German or Russian. The minimum requirement is 18 hours in one language; this includes at least 3 hours at the 400 level. Students who present three or four units of German from high school may enter the German course numbered 331 and acquire a 12-hour minor by completing 6 hours of 300 courses and 6 hours of 400 courses in German. With this 12-hour minor the foreign language requirement for the Bachelor of Arts degree is also fulfilled.

Students wishing to major in German, or to minor in German or Russian, should consult the chairman of the department.

Courses numbered 141 have no prerequisite of study of the language. Any student who has had two years (i.e., two units) of German in high school, and who wishes to continue the study of that language, should register for GERM 231. In the case of Russian, he should enroll in the 233 course. Persons who have had three or four years of German in high school, and who wish to continue it, should take GERM 331.

A student is expected to complete 12-14 hours in the same language. Thus if he has studied German or Russian for two or more years in high school, courses at the 100 level may not be used to satisfy this requirement. No student from a German- or Russian-speaking country who graduated from a secondary school in his native land may receive credit for a course in his native language numbered below 400.

Teacher Education. For certification purposes, a teaching field is offered in German, with a minimum standard program requiring 24 hours of courses numbered 200 and above. These must include 9 hours of courses on the 400 level and LING 431L.

Courses in Chinese.

FOR UNDERGRADUATES

- 131, 132. **A Beginning Course in Chinese (3:3:1 each).** Oral practice, elementary reading, and grammar.
231, 232. **A Second Course in Chinese (3:3:0 each).** Reading, cultural background, conversation, and composition.

Courses in German.

FOR UNDERGRADUATES

- 141, 142. **A Beginning Course in German (4:3:2 each).** Oral practice, elementary reading, and grammar.
231, 232. **A Second Course in German (3:3:0 each).** Prerequisite: GERM 141, 142, or two units of high school German. Reading, cultural background, conversation, composition. GERM 231, 232 and 233, 234 may not both be counted toward a degree.
233, 234. **Scientific German (3:3:0 each).** Prerequisite: GERM 141, 142, or two units of high school German. Reading of specially prepared scientific texts with grammar review. For premedical and science students. GERM 231, 232 and 233, 234 may not both be counted toward a degree.
331, 332. **German Life and Literature (3:3:0 each).** Prerequisite: GERM 231, 232 or 233, 234, or equivalent. Representative short stories, novels, dramas, and lyrics. Composition and conversation based on readings. Conducted in German.

FOR UNDERGRADUATES AND GRADUATES

431. **Advanced Grammar, Composition, and Conversation (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent, or concurrent with 331 or 332. Review of grammatical constructions and phonetic structure. Practice in pronunciation, composition, and conversation. Required of German majors. Conducted in German.
432. **Structure of the German Language (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent. Phonology, morphology, and syntax of present standard language.
433. **Nineteenth Century Drama (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent. Readings in drama from Romanticism to Naturalism, beginning with Tieck and including Hauptmann. Conducted in German.
434. **Nineteenth Century Prose and Poetry (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent. Readings in narrative prose and lyric poetry from Romanticism through Realism to Impressionism. Conducted in German.
435, 436. **Readings in German Language and Literature I, II (3:3:0 each).** Prerequisite: GERM 331 and 332, or equivalent. Readings in a field of language or literature: Classical Period, Romanticism, Contemporary Period, development of the language. May be repeated for credit with consent of instructor. Conducted in German.
4311. **Eighteenth Century Literature (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent. Extensive reading in eighteenth century literature from Rationalism through Classicism, emphasizing Lessing, Goethe, and Schiller. Conducted in German.
4312. **Goethe (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent. Intensive study of certain works of Goethe, especially his masterpiece, *Faust*. Conducted in German.
4315. **A Survey of German Literature I (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent. History of German literature from its beginnings through the Classical Age, with representative readings. Conducted in German.
4316. **A Survey of German Literature II (3:3:0).** Prerequisite: GERM 331 and 332, or equivalent. History of German literature (including that of Austria and German-Switzerland) from Romanticism to the present, with representative readings. Conducted in German.

FOR GRADUATES

- 5312, 5313. *Studies in German Language and Literature I, II (3:3:0 each)*. Prerequisite: Consent of department chairman. The contents of this course, through concentration on a literary genre, school, or linguistic topic, will vary to meet the needs of the particular group of students. May be repeated for credit.
630. *Master's Report (3)*.
631. *Master's Thesis (3)*. Enrollment required at least twice.

Courses in Russian.

FOR UNDERGRADUATES

- 141, 142. *A Beginning Course in Russian (4:3:2 each)*. Oral practice, elementary reading, and grammar.
- 233, 234. *A Second Course in Russian (3:3:0 each)*. Prerequisite: RUSN 141, 142, or two units of high school Russian. Continued study of grammar, oral practice, composition, and reading.

FOR UNDERGRADUATES AND GRADUATES

430. *Individual Studies in Slavistics (3)*. Prerequisite: RUSN 234, or equivalent. Contents will vary to meet needs of students. May be repeated for credit with consent of instructor. Independent study in Slavistics under individual guidance of a staff member.

Courses in Linguistics.

FOR UNDERGRADUATES AND GRADUATES

4311. *Applied Linguistics for Modern Foreign Languages (3:3:0)*. Prerequisite: FREN, GERM, or SPAN 331 and 332, and 6 semester hours of education. Instruction in linguistic analysis as related to the teaching of foreign languages, with as much practice work as possible. Required of majors and minors seeking teacher certification.

Department of Government

This department supervises the following degree programs: *GOVERNMENT, 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.

The requirement for a minor in government is 18 semester hours, including the required courses, GOVT 231 and 232. The requirement for a major is 30 semester hours, including GOVT 231 and 232. Students majoring in government should take certain basic courses in all fields of government. Generally, at the beginning of the junior year, several alternative fields of emphasis are offered from which the student may choose. These fields are:

- American Government and Politics (National, State, and Local)
- Comparative Government (British, Russian, Latin American, Far Eastern, Middle Eastern, and African)
- International Relations (Organization, Politics, and Law)
- Public Administration (Organization, Procedure, and Administrative Law)
- Political Theory (European, American, and Modern)
- Public Law (Constitutional, Administrative, and International)

The Department of Government serves in an advisory capacity for prelaw students. Each student having such interest is guided carefully toward fulfilling the entrance requirements for law school and is given the best possible preparatory background for his future work.

The Department of Government offers a special program at the graduate level for students interested in city manager training or work in municipal government. The course work is of an interdepartmental nature and includes courses with special emphasis on problems of municipal government. After graduation, a student may be placed as an intern in some Texas city.

Teacher Education. The Department of Government participates in the teacher education program of the College. Students seeking certification to teach in the secondary or elementary schools of Texas may qualify for such certification in the course of completing requirements for either the Bachelor of Arts or the Bachelor of Science in Education degree.

The student of government may qualify for teacher certification under a variety of plans. Students wishing to teach in the secondary schools may offer government as a teaching field. Such students must have completed at least 24 hours in government, including GOVT 231 and 232 and other courses broadly divided into fields of American government and politics, international relations, comparative government, and political theory. Those students seeking certification to teach in secondary schools in the related fields of social sciences may qualify by completing 12 hours of government, including GOVT 231 and 232, 3 hours of government from the field of American government and politics, and 3 hours from the field of international relations and com-

parative government. There is an additional requirement providing for courses in economics, sociology, and history.

Students preparing to teach in the elementary schools may offer government as an area of academic specialization. There are two plans of academic specialization open to the prospective elementary school teacher. Under one of these plans the student must complete 18 hours of government, including GOVT 231 and 232, and courses in the fields of American government and politics, international relations, and comparative government. Under the second plan, the student must complete 24 hours in government, including GOVT 231 and 232, and courses in the fields of American government and politics, international relations and comparative government, and political theory. For details on either of these plans or degree programs, the student should consult the Chairman of the Department of Government.

Courses in Government.

FOR UNDERGRADUATES

- 231. American Government, Organization (3:3:0).
- 232. American Government, Functions (3:3:0). GOVT 231 and 232 or the equivalent thereof are required of all candidates for a degree and are prerequisites to all advanced courses.
- 3321. The Political Process (3:3:0).
- 3331. Great Political Thinkers (3:3:0).
- 3341. The Administrative Process (3:3:0).
- 3351. The Judicial Process (3:3:0).
- 3361. International Politics (3:3:0).
- 3371. Comparative Government (3:3:0).

FOR UNDERGRADUATES AND GRADUATES

- 4321. Local Government (3:3:0).
- 4322. State Government (3:3:0).
- 4323. Legislation (3:3:0).
- 4324. Government and the Economy (3:3:0).
- 4325. Political Parties (3:3:0).
- 4326. Intergovernmental Relations (3:3:0).
- 4331. Ancient and Medieval Political Theory (3:3:0).
- 4332. Modern Political Theory (3:3:0).
- 4333. Contemporary Political Theory (3:3:0).
- 4334. American Political Theory (3:3:0).
- 4341. Fiscal Administration (3:3:0).
- 4342. Personnel Administration (3:3:0).
- 4343. Local Administration (3:3:0).
- 4344. The Government of Metropolitan Areas (3:3:0).
- 4345. Administrative Organization and Management (3:3:0).
- 4346. Policy and Administration (3:3:0).
- 4351. Constitutional Law-Powers (3:3:0).
- 4352. Constitutional Law-Limitations (3:3:0).
- 4353. Administrative Law and Regulations (3:3:0).
- 4354. Jurisprudence (3:3:0).
- 4361. United States Foreign Policy (3:3:0).
- 4362. Political Geography (3:3:0).
- 4363. International Organization (3:3:0).
- 4364. International Law (3:3:0).
- 4365. Problems in National Security (3:3:0).
- 4372. Government of the Union of Soviet Socialist Republics (3:3:0).
- 4373. Governments of Western Europe (3:3:0).
- 4374. Governments of Mexico and the Caribbean (3:3:0).
- 4375. Major South American Governments (3:3:0).
- 4376. Major Governments of Asia (3:3:0).
- 4377. African Governments and Politics (3:3:0).
- 4378. Middle Eastern Governments and Politics (3:3:0).
- 4379. British Government (3:3:0).
- 4381. Teaching Social Science in the High School (3:3:0).

FOR GRADUATES

- 531. Readings and Research—Individual Study (3:3:0). May be repeated for credit.
- 532. Seminar in American Government and Politics (3:3:0).
- 533. Seminar in Political Theory (3:3:0).
- 534. Seminar in Public Administration (3:3:0).
- 535. Seminar in Public Law (3:3:0).
- 536. Seminar in International Relations (3:3:0).
- 537. Seminar in Comparative Government and Institutions (3:3:0).
- 538. Seminar in Parties and Politics (3:3:0).
- 539. Seminar in National Security Affairs (3:3:0).
- 5320. Scope and Methods of Political Science (3:3:0).
- 5321. Advanced American Government and Politics (3:3:0).
- 5331. Advanced Political Theory (3:3:0).
- 5341. Advanced Public Administration (3:3:0).
- 5351. Advanced Constitutional Law (3:3:0).
- 5361. Advanced International Relations (3:3:0).
- 5371. Advanced Comparative Government and Politics (3:3:0).
- 631. Master's Thesis (3). Enrollment required at least twice.
- 731, 732. Research (3 each).
- 831. Doctor's Dissertation (3). Enrollment required at least four times.

Department of Health, Physical Education, and Recreation for Men

This department supervises a basic physical education program for all men students in the College as well as the following degree programs: *Bachelor of Arts* degrees in PHYSICAL EDUCATION or RECREATION; *Bachelor of Science in Education* degrees in ELEMENTARY or SECONDARY EDUCATION; *Bachelor of Science in PHYSICAL EDUCATION*; and *Master of Education* degrees in PHYSICAL EDUCATION.

During the first year, students majoring or minoring in the department must file a physical examination form in the office of the chairman of the department. The form for this examination should be secured from this department. Physical education majors are allowed to take elective work in physical education. Physical education courses recommended as electives are: 131, 432, 434, 437, or 438.

Basic Physical Education Program. All male students who are required to complete satisfactorily four semesters of work in physical education activities for graduation will complete work in P E 1111, Introduction to Physical Education Activities, during the first semester of their freshman year. Transfer students taking work in physical education will also be required to complete work in P E 1111 during their first semester if they have transferred less than 2 semester hours of credit in physical education. After a student has satisfactorily completed work in P E 1111, a three-semester program of physical education activities will be recommended to him. It is the purpose of the Department of Health, Physical Education, and Recreation for Men to give each student the opportunity to develop physically, socially, and mentally by providing a wide variety of physical education activities.

Bachelor of Science in Physical Education. The student who desires to major in physical education and to teach in the public schools could elect this degree. The earning of this degree qualifies the student to teach physical education on either the elementary or secondary level or to earn an all-level certificate. The student should follow the proper table for secondary certification and become familiar with the teacher education program.

The student who does not desire to teach in elementary or secondary schools, but wants to major in physical education, health education, or recreation, should elect this degree. The student should follow the curriculum as outlined for noncertification in physical education.

Bachelor of Science in Education. The student who desires to teach physical education could elect this degree. The earning of this degree qualifies the student to teach physical education on either the elementary or the secondary level, or to earn an all-level certificate as indicated below. The student should follow the curriculum outlined on the accompanying table for secondary certification and should become familiar with the teacher education program as discussed in this catalog.

The student who wishes to obtain a provisional certificate to teach at the elementary level may take either of the sequences of courses listed below, depending on his interests, in partially satisfying the requirement for 36 hours of academic specialization courses:

Sequence A: 133, 230, 233, 332, 437, 438.

Sequence B: 131, 133, 230, 233, 332, 436, 437, 438.

All-Level Provisional Certificate. The physical education major who plans to teach in the public schools can also secure an All-Level Provisional Certificate by earning a bachelor's degree and completing work in the following programs:

Physical Education: 133, 230, 233, 332, 3311, 433, 436, 437.

Required Physical Education: 221, 222, 321, and 322.

Bachelor of Arts—Major in Physical Education. Students working toward a B.A. degree with a major in physical education will meet all the general requirements for a B.A. degree. Academic specialization courses for students seeking an All-Level Provisional Certificate are: P E 133, 221,* 222,* 230, 233, 321,* 322,* 332, 3311, 433, 436, 437, and 438. Academic specialization courses for students seeking a Provisional Certificate—Secondary are: P E 133, 230, 323, 332, 3311, 422, 423, 431, 433, 436, 437, 221,* 222,* 321,* and 322.*

* Also fulfills physical education requirement.

B.A. students with a major in physical education who wish to earn a teaching certificate must also complete work in an acceptable second teaching field. Some recommended fields are biology, English, foreign language (including two 400-level courses), government, history, or mathematics. Specific courses must be approved by the chairman of the department concerned. The student must complete 24 semester hours in the field he chooses. A 2.25 average must be maintained in the major.

Minor in Physical Education. Students seeking a minor in the department will complete work in one of the following programs:

Physical Education: 131, 133, 230, 323, 332, 3311, 422, 423, 431, 433, 436, 437, and 438 (18 semester hours from the courses listed).

The required physical education courses are: 221, 222, 321, and 322.

Health Education: P E 133, 230, 332, 431, 433, 436, and 437 (18 semester hours from the courses listed).

Recreation: 331, 332, 433, 439, 4323 and 3 hours of electives. The required physical education courses are: P E 221, 222, 321, and 322.

Students who are interested in recreation and follow the recreation minor program will not receive a teaching certificate but will be qualified for positions in the various types of recreation programs offered by many institutions.

Bachelor of Arts—Major in Recreation. The Department of Health, Physical Education, and Recreation for Men offers students a program leading to the B.A. degree with a major in recreation, which qualifies them for positions in the various types of recreation programs offered by numerous groups and agencies. The general requirement for the Bachelor of Arts degree will be met. All students majoring in recreation take a core program consisting of the following courses: P E 133, 331, 332, 439; SPCH 133 or 235; S ED 330; PSY 230 and 332.

At the present time the following areas of emphasis are available to students majoring in recreation: sports, arts and crafts, music, dramatics, and park administration. All recreation majors must complete the following courses in the sports area: P E 131, 221, 222, 321, 322, 323, 422, and 433. In addition, the student must select one area from the following: art, music, dramatics, or park administration. He must also take an introductory course in each area in which he does not minor. A student desiring further information concerning the recreation major should consult the Chairman of the Department of Health, Physical Education, and Recreation for Men.

Required courses in art are ART 136, 138, 2317; also 12 semester hours of the following: ART 221, 222, 227, 3316, 3317, 3318, 3319.

Required courses in music are M LT 238, 239; M AP 1113, 1114, 1123, 1124; M ED 327; also 6 hours of electives.

Required courses in drama are SPCH 231, 232, 3312, 3313, 3314, 431, and 4311.

Required courses in park administration are HORT 131, 338; P A 134, 3313, 422, 430; AG E 232.

When necessary, the chairman will make appropriate substitutions for courses listed in the above programs.

Secondary Education Curriculum, Physical Education, Men.

FIRST YEAR

Fall		Spring	
BIOL 141, Botany or		BIOL 142, Zoology or	
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
MATH 133, Coll. Algebra or		MATH 131, Trigonometry or	
MATH 135, Fund. of Math. I or		MATH 136, Fund. of Math. I or	
Foreign Language	3-4	Foreign Language	3-4
HIST 231, Hist. of U.S. to 1877 or		HIST 232, Hist. of U.S. since 1877 or	
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
P E 133, Pers. & Comm. Health	3	P E 230, Health Ed. in Ed. &	
*P E 1111, Intro. to P.E. Act.	1	Sec. Schools	3
**P E 221, Theory & Pract. of		**P E 222, Th. & Pract. of	
Indiv. Sports	2	Team Sports	2

SECOND YEAR

Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
GOVT 231, Amer. Govt., Org. or		GOVT 232, Amer. Govt., Funct. or	
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
SOC 230, Intro. to Soc.	3	SPCH 239, Spch. Devel. for	
Teaching Field II	3	Tchr. Comp.	3
Elective	3	Teaching Field II	3
**P E 321, Th. & Fund. of		PSY 335, Adol. Psych.	3
Gym & Wrest.	2	**P E 322, El. Aquatics	2

THIRD YEAR

Fall		Spring	
S ED 330, Found. of Sec. Ed.	3	P E 431, Kinesiology	3
ED 332, Ed. Psych.	3	S ED 334, Curric. Devel. in Sec. Ed.	3
P E 332, First Aid: Care & Prev.		P E 3311, Meth. of Tchg. P.E.	
of Ath. Inj.	3	in High School	3
P E 323, Sports Officiating	2	Elective	3
Teaching Field II	6	Teaching Field II	6

FOURTH YEAR

Fall		Spring	
ED 462, Stud. Tchg. in Sec. Schl.	6	P E 436, Phys. Exam. & Correc. P.E.	3
P E 422, Theory & Fund. of		P E 423, Theory & Fund. of	
Baseball & Basketball	2	Football & Track	2
P E 433, Admin. of Health, P.E. &		S ED 436, Tchg. in Sec. Schls.	3
Rec. Prog.	3	P E 437, Meas. in P.E.	3
Teaching Field II	3	Teaching Field II	3
	14	Elective	3

Appropriate course substitutions will be made when necessary.

* Department requirement. Must complete work in this course, but 1 semester hour credit will not count.

** Required physical education.

Physical Education Curriculum, Men.

FIRST YEAR

Fall		Spring	
BIOL 141, Botany or		BIOL 142, Zoology or	
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
ENG 131, Coll. Rhct.	3	ENG 132, Coll. Rhct.	3
MATH 133, Coll. Algebra or		MATH 131, Trigonometry or	
MATH 135, Fund. of Math I or		MATH 136, Fund. of Math. II or	
Foreign Language	3-4	Foreign Language	3-4
HIST 231, Hist. of U.S. to 1877 or		HIST 232, Hist. of U.S. since 1877 or	
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
P E 131, Intro. to P.E.	3	P E 133, Pers. & Comm. Health	3
*P E 1111, Intro. to P.E. Act.	1	**P E 222, Theory & Pract. of	
**P E 221, Theory & Pract. of		Team Sports	2
Indiv. Sports	2		18-19

SECOND YEAR

Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
GOVT 231, Amer. Govt., Org. or		GOVT 232, Amer. Govt., Funct. or	
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
SOC 230, Intro. to Soc.	3	SPCH 239, Spch. Devel. for	
Minor	3	Tchr. Comp.	3
Elective	3	Minor	3
**P E 321, Theory & Fund. of		PSY 335, Adol. Psych.	3
Gym. & Wrest.	2	**P E 322, El. Aquatics	2

THIRD YEAR

Fall		Spring	
P E 332, First Aid: Care & Prev.		P E 431, Kinesiology	3
of Ath. Inj.	3	P E 3311, Meth. of Tchg. P.E.	
P E 323, Sports Officiating	2	in High Schl.	3
Minor and/or approved electives	12	Minor and/or approved electives	12

FOURTH YEAR

Fall		Spring	
P E 422, Theory & Fund. of		P E 436, Phys. Exam. & Correc. P.E.	3
Baseball & Basketball	2	P E 423, Theory & Fund. of	
P E 433, Admin. of Health, P.E.,		Football & Track	2
& Rec. Prog.	3	P E 437, Meas. in P.E.	3
P E 438, Curric. Devel. in P.E.	3	Minor and/or approved electives	9
Minor and/or approved electives	6		17

Appropriate course substitutions will be made when necessary.

* Department requirement. Must complete work in this course, but 1 semester hour credit will not count.

** Required physical education.

Courses in Basic Physical Education Program.

- 1111. **Introduction to Physical Education Activities (1:1:1).** Basic course, taken by men students in the program of required physical education. Physical conditioning, standardized physical efficiency tests and medical reports; lectures, class observations, and expert demonstrations introduce the student to activities offered by the department.
- 1112. **Adapted Physical Activities (1:0:2).**
- 1113. **Individual Activities (1:0:2).**
- 1114. **Dual Activities (1:0:2).**
- 1115. **Team Activities (1:0:2).** Students who pass any course may not repeat the same course for additional credit. These are all laboratory courses involving individual instruction.

Courses in Health, Physical Education, and Recreation for Men.

FOR UNDERGRADUATES

- 131. **Introduction to Physical Education (3:3:0).** Philosophy, aims, objectives, principles, and potential values of physical education.
- 133. **Personal and Community Health (3:3:0).** Fundamentals of health and personal hygiene; community health problems, causes and prevention of disease in the family as related to individual and community health.
- 221. **Theory and Practice of Individual Sports (2:2:2).** Rules and fundamentals of tennis, handball, and badminton.
- 222. **Theory and Practice of Team Sports (2:2:2).** Continuation of P E 221. Rules and fundamentals of volleyball, softball, speedball, and soccer.
- 223. **First Aid (2:1:2).** American Red Cross Standard, advanced and instructor's safety course.
- 230. **Methods of Teaching Health in the Elementary and Secondary School (3:3:0).** Basic principles and procedures of health education and their application to the total school health program.
- 233. **Methods of Teaching Physical Education in the Elementary School (3:3:0).** Method and content course dealing with the theory and practice of physical education.
- 310. **Health Education Workshop (1).** Prerequisite: Junior standing. One week workshop devoted to the study of problems in health education with emphasis on the coordination of federal, state, and local resources in health.
- 321. **Theory and Fundamentals of Gymnastics and Wrestling (2:2:2).** Practice in fundamental gymnastic and wrestling skills; theory, rules, and history of gymnastics and wrestling.
- *322. **Elementary Aquatics (2:2:2).** Prerequisite: Must know how to swim. Swimming fundamentals from beginner's swimming through lifesaving; principles, methods of teaching, leading to water safety instructor's certificate; principles of pool management, theory of coaching swimming, and introduction to synchronized swimming.
- 323. **Sports Officiating (2:2:2).** Prerequisite: Consent of instructor. Designed to prepare qualified teachers as officials of interscholastic sports; covers the ethics, rules, and mechanics involved.
- 331. **Recreational Methods (3:3:0).** Material appropriate for small and large groups, different age levels, and various situations; philosophy and methods; practice in planning and leading recreation.
- 332. **First Aid: Care and Prevention of Athletic Injuries (3:3:2).** Techniques of athletic training including conditioning, dieting, prevention and care of specific and common athletic injuries.
- 3311. **Methods of Teaching Physical Education in High School (3:3:0).** Aims and methods of teaching physical education in junior and senior high school.
- 422. **Theory and Fundamentals of Baseball and Basketball (2:2:2).** Offensive and defensive fundamentals of baseball and basketball; offensive and defensive systems, strategies, scouting methods, public relations, and professional ethics. Approximately two-fifths of the semester will be devoted to baseball and three-fifths to basketball.
- 423. **Theory and Fundamentals of Football and Track (2:2:2).** Individual offensive and defensive fundamentals in football and individual skills in track and field events. Offensive and defensive systems and strategies, scouting methods, public relations, and professional ethics in football. Approximately three-fifths of the semester will be devoted to football and two-fifths to track.
- 433. **Administration of Health, Physical Education, and Recreation Programs (3:3:0).**

FOR UNDERGRADUATES AND GRADUATES

- 431. **Kinesiology (3:3:0).** Principles of human motion. Anatomical and mechanical analysis of everyday and physical education activities for promoting normal physical development and improvement of performance.
- 432. **Physiology of Exercise (3:3:0).** Effect of muscular activity on body processes.
- 434. **Principles of Physical Education (3:3:0).** Prerequisite: Junior standing. This course sets forth the aims and objectives of physical education in the light of historical development of the subject matter area and its relationship to the general field of education. Included also is an analysis of the objectives and methods utilized in the present day programs. Also emphasized are trends in the field of physical education.
- 436. **Physical Examinations and Corrective Physical Education (3:3:0).** Practice in administering screening tests with interpretation of findings; organization of programs in physical education for the physically handicapped.
- 437. **Measurements in Physical Education (3:3:0).** Techniques in physical education; survey of tests used in physical education and methods of administering tests and using data.
- 438. **Curriculum Development in Physical Education (3:3:0)**
- 439. **Organization and Administration of Recreational Programs (3:3:0).** Community recreation, its significance, leadership, facilities, and organization of programs; special consideration of the contribution of physical education.
- **4321. **Methods and Techniques of Driver Instruction (3:3:2).** Preparation of high school teachers in driver education; classroom and behind-the-wheel techniques. All prospective teachers will have the opportunity to teach beginners.
- 4323. **Organization and Administration of Camps (3:3:0).** This course covers the organization and administration of various sizes, types, and kinds of camps. The objectives of camping

* Course fee, \$5.

** Course fee, \$12.50.

are emphasized along with routine administration details, procedures for staff selection, and methods of evaluation. This course is taught in a regular camp setting when possible.

4326. **Safety Education (3:3:2).** Prevention of accidents in school, home, industry, traffic, and recreation. Legal liability of accidents as well as insurance aspects of safety programs.
4331. **Teacher Training in Gymnastics (3:3:0).** Prerequisite: Junior standing. P E 4331 is a teacher-training workshop in gymnastics for elementary and secondary levels. The course is offered through the Division of Extension.

FOR GRADUATES

531. **Administration of Physical Education (3:3:0).** Principles, problems, relationships, and procedures in the supervision of elementary and high school physical education programs.
532. **Supervision of Physical Education (3:3:0).** Principles, problems, relationships, and procedures in the supervision of elementary and high school physical education programs.
533. **Facilities for Physical Education (3:3:0).** Principles, terminology, and standards for planning, constructing, using, and maintaining facilities.
534. **Administration of the School Health Program (3:3:0).** For teachers, coaches, and school administrators who desire an understanding of a well-balanced health program.
535. **Techniques of Research in Health, Physical Education, and Recreation (3:3:0).** Research methods, research design, treatment, and interpretation of data.
536. **Problems in Health, Physical Education, and Recreation (3:3:0).** Individual study of problems relating to health, physical education, and recreation. May be repeated three times for credit.
537. **Seminar in Health, Physical Education, and Recreation (3:3:0).** Specific research topics will be studied in the areas of activity analysis, physiology of exercise, and psychology of sports. May be repeated once for credit.
5322. **Organization and Administration of Interscholastic and Intercollegiate Athletic Programs (3:3:0).** Methods in organizing and administering the interscholastic and intercollegiate athletic programs. Study of: staff, program, budget, health and safety, facilities, publicity, history, duties of an athletic director, and national, state, and local controls.
5324. **Organization and Administration of Intramural Sports (3:3:0).** Administrative procedures connected with organization, records, equipment, program, and staff duties; intramural sports, officiating; ethics, rules, mechanics, and practice.
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required at least twice.

Department of Health, Physical Education, and Recreation for Women

This department supervises a basic physical education program for all women students in the College as well as the following degree programs: *Bachelor of Arts* degrees in PHYSICAL EDUCATION or RECREATION; *Bachelor of Science* in PHYSICAL EDUCATION degree; *Bachelor of Science in Education* degrees in ELEMENTARY or SECONDARY EDUCATION; and *Master of Education* degrees in PHYSICAL EDUCATION.

Each student who plans to major or minor in physical education or recreation, or minor in health, must present annually from her family physician a report of a complete physical examination. Forms for this examination should be secured from the Department of Health, Physical Education, and Recreation for Women.

Basic Physical Education Program. To satisfy the all-college requirement of four semesters of physical education, each student is required to take P E 111. This course is designed to give the student appreciation and practice in the skills of body control and effective movement. Emphasis is placed on conditioning exercises and posture.

The remaining three semesters she may select from P E 112, 113, 114, or 115. These courses are designed to give the student opportunity to continue the practice and understanding of good body mechanics and total fitness through a variety of physical activities.

Students who are majoring or minoring in physical education should enroll for P E 123, 124, 125, and 126 in the place of the above nonprofessional courses.

Major in Physical Education. Students may major or minor in physical education in the Bachelor of Arts degree program and the Bachelor of Science in Physical Education degree program or select physical education as a teaching field for certification in the Bachelor of Arts, Bachelor of Science in Physical Education, or Bachelor of Science in Education programs. The courses in physical education required for the major in the Bachelor of Arts degree are the same as those listed for the teaching field in the Bachelor of Science in Physical Education degree as outlined in this catalog. The curriculum for the nonteaching major in the Bachelor of Science in Physical Education degree is outlined in this catalog. In earning the elementary, secondary, or all-level certificate, the physical education student following the Bachelor of Arts degree must fulfill the same requirements for certification.

tion as those outlined for the Bachelor of Science in Physical Education and the Bachelor of Science in Education degrees.

Bachelor of Science in Physical Education and Bachelor of Science in Education—Physical Education Major. The curricula for these degrees are designed specifically to meet the requirements for certification in Texas. The earning of either of these degrees qualifies the student to teach physical education on either the elementary or the secondary level or to earn an all-level certificate. The student enrolled in any one of these levels should become familiar with the teacher education program.

The student who desires to teach on the secondary level should follow the curriculum outlined in this catalog.

Students who wish to obtain an all-level certificate in order to qualify to teach physical education at the elementary and secondary levels should also follow this curriculum. In addition to the courses listed in this curriculum, the student must take P E 233 and meet other requirements as outlined by the School of Education.

The student who selects physical education as an area of specialization on the elementary level may follow one of the following plans:

Plan I. P E 131, 230, 233, 328, 329, 436, 437.

Plan II. P E 131, 230, 233, 328, 329, 436, 437, 438, 4326.

All elementary physical education specialists must meet the all-college requirement of four semesters of physical education by taking P E 123, 124, 125, and 126 or equivalent courses.

Bachelor of Arts—Major in Recreation. The student who is interested in positions of leadership in recreation, rather than in teaching, should select this major. The general requirements of the Bachelor of Arts degree will be met.

The core program includes the following courses: P E 133, 331, 439, and 4326; SPCH 133 or 235; S ED 330; PSY 230 and 332.

Recreation majors must complete the following courses: P E 123, 124, 125, 126, 131, 328, 329, and 433.

In addition, the student must select a minor from the following: art, dramatics, music, or park administration. She must also take an introductory course in each area in which she does not minor. Required courses in these areas follow:

Art: ART 136, 138, 2317; also 12 semester hours from the following: ART 221, 222, 227, 3316, 3317, 3318, 3319.

Drama: SPCH 231, 232, 3312, 3313, 3314, 431, and 4311.

Music: MLT 131, 132; MAP 1113, 1114, 1123, 1124; MED 327; also 6 hours of electives.

Park Administration: HORT 131, 338; P A 134, 3313, 422, and 430; AGE 232.

Minor in Health, Physical Education, and Recreation. Students seeking a minor in the department will complete work in one of the following programs:

Health Education: P E 133, 230, 436, 431 or 437, 4326 and 3 hours of an advanced elective.

Physical Education: P E 131, 230, 233 or 4311, 328, 329, 436, 431 or 437.

Recreation: P E 131, 133, 331, 439, 4323, and 4326.

Minors in physical education and recreation must meet the all-college requirement of 4 semesters of physical education by taking 123, 124, 125, and 126 or equivalent courses.

Secondary Education Curriculum, Physical Education, Women.*

FIRST YEAR

Fall		Spring	
BTOL 141, Botany or		BIOL 142, Zoology or	
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Mathematics or Foreign Lang.	3-4	Mathematics or Foreign Lang.	3-4
P E 131, Intro. to P.E.	3	P E 133, Pers. & Comm. Health	3
P E 111, Body Cond.	1	*P E 125, Team Sports	2
P E 113, Folk Dance	1		
P E 114, Track & Field	1		

15-16

SECOND YEAR

Fall		Spring	
ZOOL 243, Human Anat. & Physiol.	4	ENG 232, Mast. of Lit.	3
ENG 231, Mast. of Lit.	3	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3	SOC 230, Intro. to Soc. or	
P E 230, Health Ed.	3	SPCH 239 or PHIL 230	3
**P E 123, Indiv. Sports	2	P E 114, Gymnastics	1
		**P E 126, Team Sports	2
	18	**P E 124, Indiv. Sports	2
			17

THIRD YEAR

Fall		Spring	
S ED 330, Found. of Sec. Ed.	3	PSY 335, Adol. Psych.	3
ED 332, Ed. Psych.	3	S ED 334, Curric. Devel. in Sec. Ed.	3
P E 431, Kinesiology	3	P E 3313, Hist. of the Dance	3
P E 328, Tech. of Sports	2	P E 329, Tech. of Sports	2
Teaching Field II or electives	6	Teaching Field II or electives	6
	17		17

FOURTH YEAR

Fall		Spring	
P E 436, Phys. Exams & Correc. P.E.	3	S ED 436, Tchg. in Sec. Schls.	3
P E 437, Meas. in P.E.	3	S ED 462, Stud. Tchg. Sec. Schls.	6
P E 4311, P.E. for Jr. & Sr. High Schls.	3	Teaching Field II or electives	6
Teaching Field II or electives	6		15
	15		

Each student who plans to major in physical education or recreation must present annually a complete physical examination report from her family physician. Forms may be secured from the Department of Health, Physical Education, and Recreation for Women.

* Students wishing to qualify to teach in both elementary and secondary schools should consult the chairman of the Department of Health, Physical Education, and Recreation for Women.

** Satisfies one semester of the College physical education requirement.

Physical Education Curriculum, Women.***FIRST YEAR**

Fall		Spring	
BIOL 141, Botany or		BIOL 142, Zoology or	
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Mathematics or Foreign Lang.	3-4	Mathematics or Foreign Lang.	3-4
P E 131, Intro. to P.E.	3	P E 133, Pers. & Comm. Health	3
P E 111, Body Cond.	1	**P E 124, Indiv. Sports	2
**P E 125, Team Sports	2		
	16-17		15-16

SECOND YEAR

Fall		Spring	
ZOOL 243, Human Anat. & Physiol.	4	ENG 232, Mast. of Lit.	3
ENG 231, Mast. of Lit.	3	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3	SPCH 239, Spch. Devel. for	
P E 230, Health Ed. or		Pers. Comp. or	
P E 233, Meth. of Tchg. P.E. in Hl. Schl.	3	PHIL 230, Intro. to Phil.	3
**P E 123, Indiv. Sports	2	**P E 126, Team Sports	2
	18	Minor or electives	3
			17

THIRD YEAR

Fall		Spring	
PSY 230, Gen. Psych. I	3	PSY 335, Adol. Psych. or	
SOC 230, Intro. to Soc.	3	PSY 331, Child Psych.	3
P E 328, Tech. of Sports	2	P E 329, Tech. of Sports	2
P E 431, Kinesiology	3	P E 3313, Hist. of the Dance	3
Minor or electives	6	P E 436, Phys. Exam. & Correc. P.E.	3
	17	Minor or electives	6
			17

FOURTH YEAR

Fall		Spring	
P E 331, Recreational Meth.	3	P E 433, Admin. of Health, P.E., & Rec. Prog.	3
P E 4326, Safety Ed.	3	P E 4323, Orig. & Admin. of Camps	3
Minor or electives	9	Minor or electives	9
	15		15

Each student who plans to major in physical education or recreation must present annually a complete physical examination report from her family physician. Forms may be secured from the Department of Health, Physical Education, and Recreation for Women.

* Nonteaching major. Students who wish to obtain a major in physical education but who do not wish to be certified to teach should follow this curriculum.

** Satisfies one semester of the College physical education requirement.

Courses in Health, Physical Education, and Recreation for Women.**FOR UNDERGRADUATES**

- 111. **Body Conditioning (1:0:2).**
- 112. **Aquatics (1:0:2).**
- 113. **Rhythmic Activities (1:0:2).**
- 114. **Individual and Dual Activities (1:0:2).**
- 115. **Team Activities (1:0:2).**
- 123. **Individual Sports (2:0:4).** Skills, strategies, and rules in selected individual and dual sports.
- 124. **Individual Sports (2:0:4).** Skills, strategies, and rules in selected individual and dual sports.
- 125. **Team Sports (2:0:4).** Skills, tactics, and rules in hockey, speedball, and soccer.
- 126. **Team Sports (2:0:4).** Skills, tactics, and rules in volleyball, basketball, and softball.
- 131. **Introduction to Physical Education (3:3:0).** Philosophy, aims, objectives, principles, and potential values of physical education.
- 133. **Personal and Community Health (3:3:0).** Fundamentals of health and personal hygiene; community health problems; causes and prevention of disease in the family as related to individual and community health.
- 223. **First Aid (2:1:2).** American Red Cross Standard, advanced and instructor's safety course.
- 230. **Methods of Teaching Health in the Elementary and Secondary School (3:3:0).** Basic principles and procedures of health education and their application to the total school health program.
- 233. **Methods of Teaching Physical Education in the Elementary School (3:3:0).** A method and content course dealing with the theory and practice of physical education.
- 328. **Technique of Sports (2:1:2).** Prerequisite: P E 123, 124. Emphasis on skills, skill analysis, and officiating.
- 329. **Technique of Sports (2:1:2).** Prerequisite: P E 126.
- 331. **Recreational Methods (3:3:0).** Material appropriate for small and large groups, different age levels, and various situations; philosophy and method; practice in planning and leading recreation.
- 3313. **History of the Dance (3:3:0).** History and philosophy of dance and the relationship of dance to allied arts.

FOR UNDERGRADUATES AND GRADUATES

- 431. **Kinesiology (3:3:0).** Principles of human motion. Anatomical and mechanical analysis of everyday and physical education activities for promoting normal physical development and improvement of performance.
- 432. **Physiology of Exercise (3:3:0).** Effect of muscular activity on body processes.
- 433. **Administration of Health, Physical Education, and Recreation Programs (3:3:0).**
- 436. **Physical Examinations and Corrective Physical Education (3:3:0).** Practice in administering screening tests with interpretation of findings; organization of programs in physical education for the physically handicapped.
- 437. **Measurements in Physical Education (3:3:0).** Techniques in physical education and methods of administering tests and using data.
- 438. **Curriculum Development in Physical Education (3:3:0).**
- 439. **Organization and Administration of Recreational Programs (3:3:0).** Community recreation, its significance, leadership, facilities, and organization of programs; special consideration of the contribution of physical education.
- 4311. **Physical Education for the Junior and Senior High School (3:3:0).** Prerequisite: Junior standing in physical education. Methods and materials for physical education in the secondary school.
- 4323. **Organization and Administration of Camps (3:3:0).** This course covers the organization and administration of various sizes, types, and kinds of camps. The objectives of camping are emphasized along with routine administration details, procedures for staff selection, and methods of evaluation. This course is taught in a regular camp setting when possible.
- 4326. **Safety Education (3:3:2).** Prevention of accidents in home, industry, and recreation.

FOR GRADUATES

- 531. **Administration of Physical Education (3:3:0).** Principles, problems, and procedures for administering physical education programs; for school administrators, athletic directors, physical education directors, and city recreation directors.
- 532. **Supervision of Physical Education (3:3:0).** Principles, problems, relationships, and procedures in the supervision of elementary and high school physical education programs.
- 533. **Facilities for Physical Education (3:3:0).** Principles, terminology, and standards for planning, construction, use, and maintenance of facilities.
- 534. **Administration of the School Health Program (3:3:0).** For teachers, coaches, and school administrators who desire an understanding of a well-balanced health program.
- 535. **Techniques of Research in Health, Physical Education, and Recreation (3:3:0).** Research methods, research design, treatment and interpretation of data.
- 536. **Problems in Health, Physical Education, and Recreation (3:3:0).** Individual study of problems relating to health, physical education, and recreation. May be taken three times for credit.
- 537. **Seminar in Health, Physical Education, and Recreation (3:3:0).** Specific research topics will be studied in the areas of activity analysis, physiology of exercise, and psychology of sports. May be repeated once for credit.
- 630. **Master's Report (3).**
- 631. **Master's Thesis (3).** Enrollment required at least twice.

Department of History

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.

A history student may consider a career in teaching in colleges and universities or in the public schools; in regional and local historical society work;

in archives and records management; and in business and industry in positions where a broad liberal arts foundation is required. In addition, career opportunities in historical park administration may be developed in conjunction with the Department of Park Administration, Horticulture, and Entomology in the School of Agriculture.

The courses recommended for the undergraduate degree program are HIST 131, 132, 231, 232, and 18 semester hours in advanced history. For a minor program in history the recommended courses are HIST 131, 132, 231, 232, and 6 semester hours in advanced history.

All courses numbered above 300 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 an advanced course in history if he wishes to have it count toward his major, minor, or teaching field requirements.

Teacher Education. In the teacher certification programs, history may be used as a teaching field at the secondary level, as an area of specialization at the elementary level, and as a part of the broad field of social sciences. Certification is possible through either the Bachelor of Science in Education degree or the Bachelor of Arts degree route.

For all three certification programs the department requires HIST 131, 132, 231, 232, and 6 advanced hours in American History. In addition, 3 more advanced hours in history are required to fulfill the Plan I elementary program, and 6 more advanced hours are needed to fulfill the 24-hour requirements of the Plan II elementary program and the teaching field of the secondary program.

Courses in History.

FOR UNDERGRADUATES

- 131, 132. Development of Civilizations (3:3:0 each).
- 231. History of the United States to 1877 (3:3:0).
- 232. History of the United States since 1877 (3:3:0).
- 330. History of Texas (3:3:0).
- 332. History of England to 1714 (3:3:0).
- 333. History of England since 1714 (3:3:0).
- 335. Development of Historical Writing (3:3:0).
- 3317. History of Military Affairs (3:3:0).

FOR UNDERGRADUATES AND GRADUATES

- 430. English Colonial America to 1763 (3:3:0).
- 431. English Colonial America after 1763 (3:3:0).
- 432. Constitutional History of the United States to 1865 (3:3:0).
- 433. Constitutional History of the United States since 1865 (3:3:0).
- 434. Early National Period in the United States (3:3:0).
- 435. The Jacksonian Era (3:3:0).
- 436. Social and Cultural History of the United States to 1865 (3:3:0).
- 437. Social and Cultural History of the United States since 1865 (3:3:0).
- 4311. The Old South (3:3:0).
- 4312. The South since the Civil War (3:3:0).
- 4313. Social and Cultural History of the Southwest (3:3:0).
- 4316. The Caribbean Area from Discovery to the Present (3:3:0).
- 4317. South America: The Southern Republics (3:3:0).
- 4318. South America: The Bolivarian Countries (3:3:0).
- 4321. South America before Independence (3:3:0).
- 4322. South America since Independence (3:3:0).
- 4323. Spanish North America (3:3:0).
- 4324. Mexico since Independence (3:3:0).
- 4325. History of Brazil (3:3:0).
- 4326. Contemporary Issues in Latin America (3:3:0).
- 4327. The American Frontier to 1803 (3:3:0).
- 4328. The Trans-Mississippi West from 1803 (3:3:0).
- 4329. The Plains Indians (3:3:0).
- 4331. History of American Science Policy (3:3:0). The politics and attitude of the American government toward scientific endeavor from independence to the present.
- 4332. History of Theology in America (3:3:0).
- 4334. Economic History of the United States to 1865 (3:3:0).
- 4335. Economic History of the United States since 1865 (3:3:0).
- 4336. The United States, 1900-1932 (3:3:0).
- 4337. The United States since 1932 (3:3:0).
- 4338. Diplomatic History of the U.S. to 1900 (3:3:0).
- 4339. Diplomatic History of the U.S. since 1900 (3:3:0).
- 4341. Modern Germany (3:3:0).
- 4342. The Habsburg Monarchy, 1867 to the Peace Settlements of World War I (3:3:0).
- 4343. Eastern Europe since the First World War (3:3:0).
- 4344. Tudor England (3:3:0).
- 4345. Stuart England (3:3:0).
- 4346. Twentieth Century Britain (3:3:0).
- 4347. Constitutional History of England to 1485 (3:3:0).
- 4348. Constitutional History of England since 1485 (3:3:0).
- 4349. The British Empire (3:3:0).

- 4351. The Near East in Modern Times (3:3:0).
- 4354. The Far East (3:3:0).
- 4355. Africa to 1500 (3:3:0).
- 4356. Africa since 1500 (3:3:0).
- 4357. The History of Islamic Peoples and Lands (3:3:0).
- 4359. Czarist Russia (3:3:0).
- 4361. Classical Civilizations: Greece and Rome (3:3:0).
- 4362. The Early Middle Ages (3:3:0).
- 4363. The Renaissance (3:3:0).
- 4364. Europe, The Age of Absolutism and the Old Regime (3:3:0).
- 4365. The French Revolution and Napoleon (3:3:0).
- 4366. Europe, 1815-1870 (3:3:0).
- 4367. Europe, 1870-1918 (3:3:0).
- 4368. Europe between World Wars I and II (3:3:0).
- 4369. Europe since 1939 (3:3:0).
- 4371. Teaching Social Studies in the High School (3:3:0).
- 4372. The Reformation (3:3:0).
- 4374. Modern Russia (3:3:0).
- 4376. European Intellectual History in the 19th and 20th Centuries (3:3:0).
- 4377. The High Middle Ages (3:3:0).
- 4378. The Late Middle Ages and The Northern Renaissance (3:3:0).
- 4379. Senior Honors (3:3:0). Prerequisite: Participate in the Honors Program and 24 hours of history.

FOR GRADUATES

Graduate courses may be repeated with departmental consent.

- 531. Proseminar in Texas History (3:3:0).
- 534. Historical Methods and Historiography (3:3:0).
- 535. Historians and Historical Literature (3:3:0). Required of all doctoral candidates.
- 5311. Studies in Southern History (3:3:0).
- 5312. Studies in Recent United States History (3:3:0).
- 5313. Studies in United States Social and Cultural History (3:3:0).
- 5314. Studies in the Frontier & Western American History (3:3:0).
- 5315. Problems in American History (3:3:0).
- 5316. Studies in Modern European History (3:3:0).
- 5317. Studies in Medieval History (3:3:0).
- 5318. Studies in Renaissance and Reformation History (3:3:0).
- 5319. Studies in Afro-Asian History (3:3:0).
- 5321. Studies in British History (3:3:0).
- 5322. Studies in United States Diplomatic History (3:3:0).
- 5323. Studies in American Constitutional History (3:3:0).
- 5324. Studies in English Colonial American History (3:3:0).
- 5325. Studies in American Economic History (3:3:0).
- 5355. History Appreciation for Teachers (3:3:0).
- 631. Master's Thesis (3). Enrollment required at least twice.
- 633. Seminar in Southwestern History (3:3:0).
- 634. Seminar in American History (3:3:0).
- 635. Seminar in European History (3:3:0).
- 636. Seminar in Latin American History (3:3:0).
- 731, 732. Research (3 each).
- 831. Doctor's Dissertation (3). Enrollment required at least four times.

Department of Journalism

The Department of Journalism directs the *Bachelor of Arts* degree program in JOURNALISM.

Majors or minors must have an overall C average in required courses; however, one D will be accepted in a required course, provided the cumulative average equals C or better. More than one D will result in the student's repeating the course. To enroll in JOUR 231, which is a basic prerequisite for advanced work in journalism, a student must be able to type.

A student minoring in journalism must present JOUR 130, 231, and 338 in the minimum of 18 required hours.

Students majoring in journalism are required to complete 33 semester hours, with a minimum of 21 hours in required courses. By the time the student reaches his junior year, he should consider one of the several fields of emphasis which the department offers and choose his courses accordingly.

The following are the required courses for all majors.

- 130. Introduction to Mass Communications
- 231, 232. Newspaper Reporting
- 336. Advanced Reporting
- 338. Editing
- 430. Law of the Press
- 4314. Seminar

In addition, the student will elect two courses from BLOCK A and one course each from BLOCKS B and C.

BLOCK A

- 131. Introduction to News Analysis
- 335. History of Journalism

- 3325. Principles of Promotion and Public Relations
- 433. Public Opinion and Propaganda
- 436. Public Opinion and Public Issues
- 4311. The Press in a Democratic Society

BLOCK B

- 233. Feature Writing
- 3312. Nonfiction Writing
- 3318. Writing for Radio and Television
- 3321, 3322. Magazine Writing and Editing

BLOCK C

- 320. Typography
- 333. Elements of Newspaper Management
- 339. Editing
- 3313. Photojournalism
- 3315. Advanced Photojournalism
- 3351. Advertising Media

ECO 235 and PSY 230 or PHIL 230 or SOC 230 are also required for a major in journalism.

The following journalism courses may be counted as satisfying the School of Arts and Sciences requirement of 6 hours of social science other than major or minor.

- 335. History of Journalism
- 430. Law of the Press
- 433. Public Opinion and Propaganda
- 436. Public Opinion and Public Issues
- 4311. The Press in a Democratic Society.

Teacher Education. In the teacher education program of the College the department offers work in a teaching field (Plan I) for those planning careers in the secondary schools, and is approved as one of the social sciences in the broad field (Plan II) program for secondary teachers.

The following journalism courses constitute the required courses for the secondary teaching field (Plan I):

- 130. Introduction to Mass Communications
- 231. Newspaper Reporting
- 233. Feature Writing
- 335. History of Journalism
- 338. Editing
- 3313. Photojournalism
- 430. Law of the Press
- 432. Journalism for the High School Teacher

Courses in Journalism.

FOR UNDERGRADUATES

- 130. **Introduction to Mass Communications (3:3:0).** A broad survey of communications agencies in modern life, with particular emphasis on newspapers, magazines, radio, television, and the motion picture.
- 131. **Introduction to News Analysis (3:3:0).** Study of major news stories of the day and function of mass communications media in American life. Introduction for journalism and non-journalism majors to an intelligent following of current events as presented in the newspaper, news magazines, radio, and television.
- 231, 232. **Newspaper Reporting (3:2:3 each).** JOUR 231 is prerequisite to all higher journalism courses for majors and minors. Majors and minors enrolled in this course are required to work on the University Daily.
- 233. **Feature Writing (3:3:0).**
- 320. **Typography (2:1:3).** Brief history and evolution of typography; choice of types and their arrangement; type harmony and readability; mechanics of printing and publishing; engraving, printing processes, and presses.
- 333. **Elements of Newspaper Management (3:3:0).** Organization field of service, personnel, equipment, production, community relations, labor relations, accounting, field trips, investigative projects.
- 335. **History of American Journalism (3:3:0).** Study of the development of journalism in America from its European roots to the present and of its interrelation with society.
- 336. **Advanced Reporting (3:2:3).** Prerequisite: JOUR 231, 232. A course in the interrelation and writing of news on social, political, and economic topics. Instruction in techniques of specialized reporting given through off-campus laboratory assignments.
- 3312. **Nonfiction Writing (3:3:0).** For non-journalism majors wishing to do research in their own fields. Students write features and articles for possible inclusion in professional publications in their individual specialties.
- 3313. **Photojournalism (3:1:6).** Varied assignments of news and feature pictures. Lecture and laboratory cover picture processing, practice, and study of picture editing.
- 3315. **Advanced Photojournalism (3:1:6).** Individual or group investigation into selected areas of photography; instruction and use of 16 mm movie cameras in news filming techniques; lectures in color photography, portraiture, advanced techniques with various types of

cameras. For students interested in newspaper, magazine, television news, and advertising photography.

3318. **Writing for Radio and Television (3:2:3).** Training in writing news, continuity and public affairs for broadcast by radio or television. SPCH 335 recommended.
- 3321, 3322. **Magazine Writing and Editing (3:2:3 each).** A study of the scope, influence, and responsibilities of the magazine as a cultural and social force. Survey of editorial problems; intensive writing practice; market study; laboratory problems in copy preparation, picture editing, page layout and typographical display of the magazine. Members of the class are encouraged to work on *La Ventana*.
3325. **Principles of Promotion and Public Relations (3:3:0).**
3351. **Advertising Media (3:3:0).** A study of the various advertising media to provide journalism, advertising, and advertising art students with a knowledge of the use of advertising media, methods of selection, and the skills and background required for media buying. Course will also cover methods of testing media effectiveness in newspapers, radio, television, and magazines, in addition to miscellaneous media, i.e., transient, outdoor, direct mail, etc. Field trips.

FOR UNDERGRADUATES AND GRADUATES

- 338, 339. **Editing (3:2:3 each).** Prerequisite: JOUR 231. Intensive study and practice of editing principles, plus basic problems involved in the design and makeup of the newspaper. Includes practice in makeup, copyfitting, selection of types. Members of the class are required to work on the *University Daily* copy desk.
411. **Special Problems in Journalism (1).** Prerequisite: Senior or graduate classification, juniors only with consent of department chairman. Individual research on approved problems in one of the following journalistic fields: news-editorial, radio-television, photography, magazine, public relations, and advertising. May be repeated for credit.
430. **Law of the Press (3:3:0).** A study of the laws which guarantee and protect the privileges and define the duties and responsibilities of the press.
432. **Journalism for the High School Teacher (3:3:0).** Study and practice with the problems met by a publication supervisor in directing newspapers and yearbooks, functions of school publications, organization and training of the staff; editorial and business problems; problems with printers. May be counted as an education elective by secondary education students.
433. **Public Opinion and Propaganda (3:3:0).** The nature of public opinion; the role of the press in its formation and how the press is influenced by public opinion. Propaganda analysis; the purpose, devices, and effects of propaganda and censorship.
436. **Public Opinion and Public Issues (3:3:0).** A broad synthesis course of the social and natural sciences. A study of some of the great problems that face the citizen; the major mass media of communications and public opinion; how the mass media deal with great problems.
4311. **The Press in a Democratic Society (3:3:0).** A study of the newsman's role in analyzing major and continuing issues for the public. Special emphasis will be on state and local government, civil rights, labor, business, and religion.
4314. **Seminar (3:3:0).** Prerequisite: Senior standing. A seminar in problems of American journalism.

FOR GRADUATES

530. **Seminar in Education for Journalism (3:3:0).** Prerequisite: Graduate standing. History of education for journalism with emphasis on current philosophies. Journalism and the liberal arts; areas of specialization; critical investigation and evaluation of curriculum, teacher preparation and student guidance.
531. **Seminar in Modern Editing (3:3:0).** Prerequisite: Graduate standing. Critical and analytical approach to the problems of editing newspapers, magazines, and radio-television news copy; audience analysis; legibility formulas; intelligibility scales; study of space age communications devices.
532. **Seminar in Public Opinion and Propaganda (3:3:0).** Prerequisite: Graduate standing. Study of the developing literature in this field of specialization. Bases of public opinion and propaganda. Opinion-making processes of governments, political parties, pressure groups, and other organized groups.
533. **Seminar in Legal Problems of Mass Communications (3:3:0).** Prerequisite: Graduate standing. Reading and research in law of libel, privileged areas, privacy, and other legal problems facing the mass media.
534. **Methods of Research (3:3:0).** Prerequisite: Graduate standing. The tools and methods of research; qualitative and quantitative measures; testing of data for reliability and validity; interpretation of research findings.
535. **Administration of Communication Media (3:3:0).** Prerequisite: Graduate standing. Problems of executive planning and management of newspapers, magazines, and broadcast media; personnel and labor problems; study of state and federal laws affecting the industries.
536. **Problems in Investigative Reporting (3:3:0).** Prerequisite: Graduate standing. A seminar in public affairs reporting at the local, state, and regional levels. In-depth study of social, political, and economic questions; preparation of articles in these areas.
537. **Seminar in the Press and Society (3:3:0).** Prerequisite: Graduate standing. Examination of the news media in terms of their social significance and their effects upon people and institutions. Evaluations of press performance.
538. **Advanced Graphic Arts Design and Production Control (3:3:0).** Prerequisite: Graduate standing. Preparation of copy for all forms of letterpress, photo offset, engraving, rotogravure; silk screen; deep etch lithography; process color; scheduling, costing, and production supervision and management.
539. **Studies in Latin American Journalism (3:3:0).** Prerequisite: Graduate standing. Comparative analysis of South and Central American media of communications. Studies of press development and influence.

Department of Mathematics

This department supervises the following degree programs: *MATHEMATICS, Bachelor of Arts or Bachelor of Science, Master of Arts or Master of Science, Doctor of Philosophy.*

A minimum of 33 semester hours is required for the Bachelor of Arts in mathematics, while 36 hours are required for the Bachelor of Science. For the recommended curriculum in mathematics leading to the degree of Bachelor of Science, see the accompanying table. For curriculum leading to the Bachelor of Arts, follow the general pattern for that degree described in the Arts and Sciences section of this catalog. MATH 434 and 4321 are required for all degrees in mathematics. French, German, or Russian must be taken by the mathematics major to satisfy the foreign language degree requirement for the Bachelor of Science degree, and are recommended for the Bachelor of Arts degree.

The department adviser must approve the 6 hours of advanced work (courses numbered 300 and above) required of all minors. For either a major or a minor in mathematics a student must have a grade of C or better for each course in mathematics counted toward the degree.

Beginning science, mathematics, and engineering students will be allowed to enroll directly in MATH 151 (Analytic Geometry and Calculus I) only if their test scores on the advanced Achievement Test in Mathematics or on other suitable placement tests indicate reasonable proficiency in algebra and trigonometry. Those students not qualifying for MATH 151 will be advised to take preparatory mathematics courses. Mathematics majors who are required to take preparatory mathematics courses still will be required to take the normal 18 hours of advanced mathematics needed for the completion of the undergraduate degree in mathematics. All beginning science, mathematics, and engineering students who cannot qualify for direct admission to MATH 151 are encouraged to take preparatory mathematics courses in summer school.

Arts and Sciences students, exclusive of science and mathematics majors, may use any combination of mathematics courses to satisfy general degree requirements if they qualify for enrollment in these courses. The MATH 135, 136 sequence is particularly recommended for students needing 6 hours of mathematics. For students needing only 3 hours, MATH 136 is recommended as a terminal course for the student with a good background in high school mathematics; MATH 135 is an excellent terminal course for the average student.

Teacher Education. The Department of Mathematics offers programs for teacher certification in mathematics at both the elementary and secondary school levels. Students may achieve such certification by completing the requirements for either the Bachelor of Arts degree or the Bachelor of Science in Education degree. The student preparing to teach in the elementary schools may select mathematics as an area of academic specialization under Plan I (18 hours) or Plan II (24 hours). Students wishing to teach in the secondary schools may select mathematics as a teaching field. See the Chairman of the Department of Mathematics for information concerning these teacher certification plans.

Semester hour requirements and normal course options for the teaching field in mathematics at the secondary level are as follows:

1. 6 semester hours selected from MATH 131, 133, 1315, 233.
2. MATH 151, 152.
3. 12 hours of approved junior and senior level courses, including MATH 431.

Mathematics Curriculum, B.S. Degree.

FIRST YEAR

Fall		Spring	
*MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Foreign Language	3-4	Foreign Language	3-4
**Science elective	4	**Science elective	4
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1

SECOND YEAR

Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	MATH 233, Linear Algebra	3
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
Foreign Language	3	Foreign Language	3
Science (for minor)	3-4	Science (for minor)	3-4
Science elective	4	Science elective	4
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
17-19		17-19	

THIRD AND FOURTH YEARS

Fall		Spring	
MATH 332, Diff. Equat. I	3	MATH 4321, El. Mod. Algebra	3
MATH 434, Adv. Calc.	3	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3	Math. electives	9
Science (for minor)	6	Science (for minor)	6
Approved electives	12	Approved elective	3
30		27	

* The course list should be consulted for admission requirements for MATH 151. If a student is required to take MATH 131 and 133 prior to enrollment in MATH 151, the result will be an increase of 6 hours of mathematics in his major requirements.

** Science electives must be chosen from courses offered in biology, chemistry, physics, or geosciences, but not from the field selected as a minor. Eight hours of science electives must be in one field.

Courses in Mathematics.

FOR UNDERGRADUATES

131. **Trigonometry (3:3:0).** Prerequisite: Admission granted on the basis of placement test scores. Trigonometric functions; radians; logarithms; solutions of triangles; composite angles; identities; trigonometric equations; complex numbers; De Moivre's Theorem.
133. **College Algebra (3:3:0).** Prerequisite: Admission granted on the basis of placement test scores. Inequalities; determinants; theory of equations; binomial theorem; progressions; mathematical induction.
135. **Fundamentals of Mathematics I (3:3:0).** Basic concepts in elementary mathematics. Number sets and operations; algebraic structures; elementary functions.
136. **Fundamentals of Mathematics II (3:3:0).** Prerequisite: MATH 135 or one semester of college mathematics. Logic; fundamentals of set theory; mathematical structures; axiom systems.
- 137, 138. **Introductory Mathematical Analysis (3:3:0 each).** Prerequisite: Two units of high school mathematics. Introductory logic; set theory; real number properties; inequalities; equations; relations; functions; vectors; matrices; linear programming; probability; progressions; analytic geometry; elementary calculus.
1310. **Structure of Arithmetic for Elementary Teachers (3:3:0).** Intuitive development of the real number system; fundamental operations and concepts of arithmetic; a set-theoretic approach.
1311. **Algebra for Elementary Teachers (3:3:0).** Algebraic structure of the real number system; groups; rings; fields; mathematical systems; topics in elementary number theory.
1315. **Introductory College Mathematics (3:3:0).** Prerequisite: Admission granted on the basis of placement test scores. Review of trigonometry and college algebra; rational functions; simple transcendental functions; coordinate geometry.
151. **Analytical Geometry and Calculus I (5:5:0).** Prerequisite: Satisfactory placement test scores, or the equivalent of MATH 1315. Inequalities; determinants; elementary theory of equations; mathematical induction. Introduction to analytical geometry; limits; the derivative; rates.
152. **Analytical Geometry and Calculus II (5:5:0).** Prerequisite: MATH 151. Logarithms; polar coordinates; parametric equations; differentiation; maxima and minima; rectilinear and curvilinear motion; formal integration; definite integrals; applications.
233. **Linear Algebra (3:3:0).** Prerequisite: MATH 152. Finite-dimensional vector spaces; linear transformations and matrices; quadratic forms; eigenvalues and eigenvectors; vector spaces over the complex numbers.
235. **Analytical Geometry and Calculus III (3:3:0).** Prerequisite: MATH 152. Partial differentiation; infinite series; indeterminate forms; hyperbolic functions; functions of several variables; multiple integrals.
238. **Statistics (3:3:0).** Prerequisite: MATH 133, or 135, or the equivalent. Collection and tabulation of data; bar charts; graphs; sampling, averages; dispersion; correlation index numbers; normal curve; probability, applications to various fields. Credit for the course may not be used toward a degree in mathematics.
332. **Differential Equations I (3:3:0).** Prerequisite: MATH 235 or concurrent registration. Solutions of ordinary differential equations; geometric and physical applications.
334. **History of Mathematics (3:3:0).** Prerequisite: MATH 152. Historical development of mathematics; history of the applications of mathematics; impact of mathematics on the development of our culture and civilization.
335. **Higher Mathematics for Engineers and Scientists I (3:3:0).** Prerequisite: MATH 235 or concurrent registration. Ordinary differential equations; Laplace transforms.
336. **Higher Mathematics for Engineers and Scientists II (3:3:0).** Prerequisite: MATH 332 or 335. Fourier series; partial differential equations.
337. **College Geometry (3:3:0).** Prerequisite: MATH 151. Directed segments and angles; similitude; inversion; geometry of the triangle, quadrilateral, and circle.
339. **Foundations of Algebra and Analysis (3:3:0).** Axiomatic systems; mathematical systems; elementary symbolic logic; methods of constructing proofs; fundamental concepts of abstract algebra and analysis.
3318. **Finite Mathematical Structures (3:3:0).** Prerequisite: MATH 151. Logical development of mathematical structures; compound statements and truth tables; sets and functions; probability theory; Markov chains; applications in the physical and social sciences.

FOR UNDERGRADUATES AND GRADUATES

430. **Synthetic Projective Geometry (3:3:0)**. Prerequisite: MATH 337 or consent of the instructor. Fundamental theorems of projective geometry treated synthetically.
431. **Teaching of Mathematics in the Secondary Schools (3:3:0)**. Prerequisite: 12 semester hours of college mathematics and consent of instructor.
432. **Differential Equations II (3:3:0)**. Prerequisite: MATH 332. Existence theorems; systems of differential equations.
- 434, 435. **Advanced Calculus (3:3:0 each)**. Prerequisite: MATH 339 or equivalent. Sets; functions; vector fields; partial derivatives; power series; theory of integration; line, surface, and multiple integrals.
437. **Theory of Numbers (3:3:0)**. Prerequisite: MATH 152. Prime numbers; congruences; theorems of Fermat, Euler, and Wilson; residues; reciprocity law; Diophantine Equations.
- 4310, 4311. **Introduction to Numerical Analysis I, II (3:3:0 each)**. Prerequisite: MATH 332 or 335. Interpolation; approximations; numerical integration and differentiation; roots of polynomial equations; numerical quadrature; solution of ordinary differential equations.
4313. **Probability (3:3:0)**. Prerequisite: MATH 152. Permutations and combinations; additive and multiplicative laws of probability; expectation; Bayes' theorem; continuous and discontinuous distribution functions; applications.
- 4314, 4315. **Mathematical Statistics (3:3:0 each)**. Prerequisite: MATH 235. Frequency functions; moments; probability; correlation and regression; testing hypotheses; small sample distributions; analysis of variance; non-parametric methods; sequential analysis.
4316. **Introductory Point-Set Topology (3:3:0)**. Prerequisite: MATH 339. Axiomatic treatment of topological spaces; connectedness; compactness; separation properties; metric spaces.
4317. **Actuarial Mathematics (3:3:0)**. Prerequisite: MATH 151. Theory of mortality tables; life annuities, premiums; terminal reserves; joint-life annuities and insurance; applications.
4319. **Elementary Functions of Complex Variables (3:3:0)**. Prerequisite: MATH 235. The complex number system; functions of a complex variable; differentiation; elementary functions; and contour integration.
4321. **Elementary Modern Algebra (3:3:0)**. Prerequisite: MATH 233. The number system; mathematical induction; integral domains; determinants and matrices; rings and fields.
4324. **Matrix Theory (3:3:0)**. Prerequisite: MATH 152. Matrices and determinants; rank; equivalence; transformations; vector spaces; characteristic equation of a matrix.
4325. **Computational Methods of Linear Algebra (3:3:0)**. Prerequisite: MATH 4324. Numerical methods involved in the solution of linear systems; matrix inversions; eigenvalue problems; ill-conditioned matrices.
4327. **Mathematical Programming (3:3:0)**. Prerequisite: MATH 152. Linear inequalities; linear programming algorithms; networks; parametric and discrete linear programming; non-linear and dynamic programming; optimal decision techniques; application.
- 4328, 4329. **Statistical Methods I, II (3:2:2 each)**. Prerequisite: Completion of mathematics requirements for respective majors or consent of instructor. Methods of analyzing data; statistical concepts and models; estimation; tests of significance; linear regression and correlation; introduction to analysis of variance; introduction to multiple comparisons; factorials; individual degrees of freedom; multiple regression; covariance.
4331. **Introduction to Difference Equations (3:3:0)**. Prerequisite: MATH 235. The calculus of finite differences; solutions of difference equations; Bernoulli and Euler numbers; polynomials.
4332. **Selected Topics (3:3:0)**. Prerequisite: Consent of instructor. Selected topics in upper division mathematics.
4391. **Vector Analysis (3:3:0)**. Prerequisite: MATH 235. Scalar and vector products; gradient; divergence; curl; curvilinear coordinates; applications.
4392. **Tensor Analysis (3:3:0)**. Prerequisite: MATH 4391 or consent of instructor. Analytical treatment of tensors and extensors and their properties; Riemann-Christoffel Tensors; applications.
- 511, 512. **Seminar (1:1:0 each)**. Prerequisite: Graduate standing in mathematics. May be repeated for credit.
531. **Advanced Problems (3:3:0)**. Prerequisite: Graduate standing in mathematics. May be repeated for credit.
- 532, 533. **Intermediate Analysis I, II (3:3:0 each)**. Prerequisite: Graduate standing. Introduction to mathematical analysis; includes integration theory; theory of limits; infinite processes.
- 534, 535. **Theory of Numbers I, II (3:3:0 each)**. Prerequisite: MATH 437. Diophantine equations; binary quadratic forms; algebraic numbers; theory of number-theoretic functions; partitions; the prime number theorem.
- 536, 537. **Modern Algebra I, II (3:3:0 each)**. Prerequisite: MATH 4321 or consent of instructor. Groups; rings; fields; linear algebra; Galois theory.
538. **Foundations of Mathematics (3:3:0)**. Prerequisite: Graduate standing in mathematics. Selected topics in algebra; the number system; the axiomatic approach to mathematics.
539. **Dimension Theory (3:3:0)**. Prerequisite: MATH 5317 or consent of instructor. Dimension; dimension of Euclidean spaces; covering and imbedding theorems; mappings in spheres; dimension and measure.
- 5312, 5313. **Functions of a Complex Variable I, II (3:3:0 each)**. Prerequisite: MATH 434 or 4319. The extended complex plane elementary transformations; power series; complex integration; Taylor and Laurent expansions; meromorphic and entire functions; the calculus of residues.
- 5314, 5315. **Functions of a Real Variable I, II (3:3:0 each)**. Prerequisite: MATH 435. The real number system, set and measure theory; properties of Riemann and Lebesgue integrals.
- 5316, 5317. **Topology I, II (3:3:0 each)**. Prerequisite: MATH 4316. Point set theory; introduction to combinatorial topology.
5318. **Operational Calculus (3:3:0)**. Prerequisite: MATH 434. The convolution of continuous functions; extension to operators and the operational calculus, the Laplace transform and the convolution transform.
5319. **Fourier Analysis (3:3:0)**. Prerequisite: MATH 5315. Orthogonal series; convergence and summability of Fourier series; Fourier transforms.
- 5321, 5322. **Methods of Applied Mathematics I, II (3:3:0 each)**. Prerequisite: MATH 4319 or its equivalent. Theory of congruence. Special functions; fourier series, Laplace transforms; boundary value problems; topics in functional analysis.
- 5323, 5324. **Theory of Ordinary Differential Equations I, II (3:3:0 each)**. Prerequisite: MATH 432, 435, or consent of instructor.

- 5325, 5326. **Partial Differential Equations I, II (3:3:0 each)**. Prerequisite: MATH 432, 435, or consent of instructor.
- 5329, 5330. **Numerical Analysis I, II (3:3:0 each)**. Prerequisite: MATH 431. Stability and error analysis; numerical solution of ordinary and partial differential equations; integral equations.
- 5331, 5332. **Advanced Topics in Analysis I, II (3:3:0 each)**. Prerequisite: Consent of instructor.
- 5333, 5334. **Functional Analysis I, II (3:3:0 each)**. Prerequisite: MATH 5314. Normal linear spaces and their abstract completions. Closed graph theorem. Theorem of uniform boundedness. Hahn-Banach theorems. Weak topologies; adjoints; resolvents; convex sets and related topics.
- 5335, 5336. **Advanced Mathematics for Teachers I, II (3:3:0 each)**. Prerequisite: Consent of instructor. Selected topics in mathematics.
- 5337, 5338. **Topics in Numerical Analysis I, II (3:3:0 each)**. Prerequisite: MATH 5330, 4325. Current advanced topics in numerical analysis; research work using computers.
- 5341, 5342. **Advanced Topics in Algebra I, II (3:3:0 each)**. Prerequisite: Consent of instructor.
- 5345, 5346. **Algebraic Topology I, II (3:3:0 each)**. Prerequisite: MATH 537 and 5317 or consent of instructor. Categories, functors; homotopy; fundamental group; covering spaces; homology; the Eilenberg-Steenrod axioms; cohomology; products; higher homotopy groups; obstruction theory; related topics.
- 5347, 5348. **Riemann Surface Theory I, II (3:3:0 each)**. Prerequisite: MATH 5313 or consent of instructor. Manifolds; Riemann surface of an analytic function; covering manifolds; combinatorial topology; differential and integrals on Riemann surfaces; uniformization.
5349. **Nonparametric Statistical Inference (3:3:0)**. Prerequisite: MATH 4315. Statistical inference; asymptotic distribution theory; tests on permutation of observation; rank order statistics; nonparametric tolerance limits; theory of runs.
5351. **Advanced Topics in Geometry (3:3:0)**. Prerequisite: Consent of instructor.
5352. **Differentiable Manifolds (3:3:0)**. Prerequisite: MATH 4316 or consent of instructor. Differentiable mappings; manifolds; differential forms and the Grassmann algebra.
- 5353, 5354. **Theory of Generalized Functions I, II (3:3:0 each)**. Prerequisite: MATH 5312 and 5314 or consent of instructor. Schwartz distribution and their properties; analytic representations; Fourier transforms of distributions; linear topological spaces; distributions and kernels.
- 5355, 5356. **Theory of Groups I, II (3:3:0 each)**. Prerequisite: MATH 536 or consent of instructor. Composition series; Abelian and solvable groups; direct and sub-direct products; nilpotent groups; permutation groups; and selected topics.
- 5357, 5358. **Theory of Rings I, II (3:3:0 each)**. Prerequisite: MATH 536 or consent of instructor. Modules; chain conditions; radicals; semi-simplicity; commutative rings; algebras; tensor products; and selected topics.
- 5361, 5362. **Advanced Topics in Topology I, II (3:3:0 each)**. Prerequisite: MATH 5317 and consent of instructor.
5371. **Design of Experiments (3:3:0)**. Prerequisite: MATH 4315. Principles of design and analysis of experiments; Latin squares; split plots; incomplete block designs; efficiency.
5372. **Theory of Linear Statistical Models (3:3:0)**. Prerequisite: MATH 4315. Multivariate normal; covariance matrix and operations; distribution of quadratic forms; general linear hypothesis of full and non-full rank; specific linear models.
5373. **Stochastic Processes (3:3:0)**. Prerequisite: MATH 4313. Study of processes which develop in time according to probabilistic laws; Brownian motion and life and death processes; stochastic models; Markov processes; Ergodic theorems.
- 5374, 5375. **Advanced Mathematical Statistics I, II (3:3:0 each)**. Prerequisite: MATH 4315. Topics selected from analysis of variance and design of experiments; multivariate analysis; sampling from finite populations; nonparametric methods; sequential analysis.
- 5376, 5377. **Advanced Probability I, II (3:3:0 each)**. Prerequisite: MATH 4313, 5314, and 5315. Measure and integration, axiomatic foundations of probability theory; random variables; distributions and their characteristic functions; stable and infinity divisible laws; limit theorems for sums of independent random variables; conditioning; Martingales.
630. **Master's Report (3)**.
631. **Master's Thesis (3)**. Enrollment required twice.
731. **Research (3:3:0)**. Prerequisite: Consent of chairman of department. Research in advanced mathematics. Can be repeated for credit.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Courses in Astronomy.

FOR UNDERGRADUATES

111. **Survey of Astronomy (1:1:0)**. The main features of the known universe and the principles involved in their discovery. A non-mathematical survey.
- 231, 232. **General Astronomy (3:3:0 each)**. Prerequisite: MATH 131 or equivalent. The solar, stellar, and galactic systems, studied with attention to technical details.

Department of Music

The curricula of the Department of Music offer the undergraduate student a choice of three degrees: *Bachelor of Music*, *Bachelor of Music Education*, and *Bachelor of Arts*. The recommended curricula for the *Bachelor of Music* (both APPLIED MUSIC and MUSIC THEORY) and *Bachelor of Music Education* degrees are set forth in the accompanying tables. The *Bachelor of Arts* curriculum is flexible. Graduate degrees offered are *Master of Music* (APPLIED MUSIC) and *Master of Music Education*. Graduate students are referred to the *Graduate Catalog*.

The following general regulations govern all work in the Department of Music.

Nonmusic majors may elect class or private instruction in voice or in any instrument. Each student enrolled in applied music is carried at his maxi-

imum level of achievement, and the nonmusic major is not examined in competition with the music major. Courses designed to serve all students enrolled in the College are Applied Music (vocal or instrumental, class or private instruction); Applied Music, all levels; M LT 238, 239, 431, 432, M EN 110-1, 310-1 (Tech Choir), 110-2, 310-2 (Women's Chorus), 111-3, 311-3 (Chamber Music), 110-4, 310-4 (Tech Opera Theater), 110-5, 310-5 (Tech Singers), 111-1, 311-1 (Orchestra), 113-A, 313-A (Tech Band), 313-C (Tech Stage Band.)

Entering freshman music majors should have studied previously and should have attained technical proficiency in applied music sufficient to qualify for a course numbered 125 or above. Classification for courses will be made during orientation week.

Students transferring from other approved institutions will be administered placement examinations in applied music and music theory. Music majors enrolled in the College are expected to study applied music with College faculty. Students who do not qualify for courses above the 125 level must register for M AP 125 until the deficiency is removed. Students following a plan for a major in music education will study the principal instrument for six semesters. Satisfying all requirements for the professional degree in music education may require more than eight semesters. Students following a plan for a major in applied music will study the principal instrument for eight semesters. The applied music major is required to attain a higher performance proficiency than is required of the music education major concentrating in the same field.

The student must earn a minimum grade of C to qualify for successive levels of freshman and sophomore music theory.

Entering freshmen may receive credit for college-level work accomplished prior to entrance into the College. This may be done through advanced standing examinations administered by the faculty of the Department of Music, after the student has obtained permission from the Dean of the School 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 examinations.

All music students will have their work in their principal applied music studies periodically reviewed by the faculty. Each music major will be required to present a half recital during the junior year. Applied music majors will be required to present a full recital during the senior year. Permission to present each recital must be obtained from an examining jury during the semester preceding the recital presentation. All students whose principal applied study is not piano must demonstrate proficiency in piano. Practical experience in accompanying is required of students enrolled with piano as the principal instrument.

Attendance at 20 of the student recitals, faculty recitals, and performances by major organizations is required of all music majors each semester. Failure to meet this requirement may result in an increase in the number of hours needed to complete degree requirements.

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.

Applied Music—Piano Curriculum.

		FIRST YEAR	
Fall		Spring	
M AP 111, Keyboard Skills	1	M AP 112, Keyboard Skills	1
M AP 145, Piano	4	M AP 146, Piano	4
M LT 131, Intro. to Mus. Lit.	3	M LT 132, Intro. to Mus. Lit.	3
M TH 143, El. Theory	4	M TH 144, El. Theory	4
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Ensemble	1	Ensemble	1
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1

SECOND YEAR

Fall	
M AP 211, Keyboard Skills	1
M AP 245, Piano	4
M TH 243, Intermed. Theory	4
ENG 231, Mast. of Lit.	3
GOVT 231, Amer. Govt., Org.	3
Ensemble	1
P.E., Band, or Basic ROTC	1-2

17-18

Spring	
M AP 212, Keyboard Skills	1
M AP 246, Piano	4
M TH 244, Intermed. Theory	4
ENG 232, Mast. of Lit.	3
GOVT 232, Amer. Govt., Funct.	3
Ensemble	1
P.E., Band, or Basic ROTC	1-2

17-18

THIRD YEAR

Fall	
M AP 345, Piano	4
M TH 333, Form & Comp.	3
M ED 327 or 328, Ch. Cond. or Instr. Cond.	2
HIST 231, Hist. of U.S. to 1877	3
M LT 435, Keyboard Lit.	3
Ensemble	1

16

Spring	
M AP 346, Piano	4
M TH 334, Form and Comp.	3
M LT 436, Keyboard Lit.	3
HIST 232, Hist. of U.S. since 1877	3
Elective	3
Ensemble	1

17

FOURTH YEAR

Fall	
M AP 445, Piano	4
Elective	3
M LT 431, Hist. of Music	3
M TH 435, Counterpoint	3
Ensemble	1

14

Spring	
M AP 446, Piano	4
M TH 427, Instrumentation	2
M LT 432, Hist. of Music	3
M ED 433, Piano Pedagogy	3
Ensemble	1

13

Applied Music—Organ Curriculum.

FIRST YEAR

Fall	
M AP 145, Organ	4
M LT 131, Intro. to Mus. Lit.	3
M TH 143, El. Theory	4
ENG 131, Coll. Rhet.	3
Ensemble	1
P.E., Band, or Basic ROTC	1

16

Spring	
M AP 146, Organ	4
M LT 132, Intro. to Mus. Lit.	3
M TH 144, El. Theory	4
ENG 132, Coll. Rhet.	3
Ensemble	1
P.E., Band, or Basic ROTC	1

16

SECOND YEAR

Fall	
M AP 245, Organ	4
M TH 243, Intermed. Theory	4
ENG 231, Mast. of Lit.	3
GOVT 231, Amer. Govt., Org.	3
Ensemble	1
P.E., Band, or Basic ROTC	1-2

16-17

Spring	
M AP 246, Organ	4
M TH 244, Intermed. Theory	4
ENG 232, Mast. of Lit.	3
GOVT 232, Amer. Govt., Funct.	3
Ensemble	1
P.E., Band, or Basic ROTC	1-2

16-17

THIRD YEAR

Fall	
M AP 345, Organ	4
M AP 327, Church Service Playing	2
M TH 333, Form and Comp.	3
M ED 327, Choral Conducting	2
HIST 231, Hist. of U.S. to 1877	3
Elective	3
Ensemble	1

18

Spring	
M AP 346, Organ	4
M TH 334, Form and Comp.	3
M ED 328, Instrumental Cond.	2
HIST 232, Hist. of U.S. since 1877	3
Elective	3
Ensemble	1

16

FOURTH YEAR

Fall	
M AP 445, Organ	4
M TH 435, Counterpoint	3
M LT 431, Hist. of Music	3
Music Elective	3
Ensemble	1

14

Spring	
M AP 446, Organ	4
M TH 427, Instrumentation	2
M LT 432, Hist. of Music	3
Music Elective	3
Ensemble	1

13

Applied Music—Voice Curriculum.

FIRST YEAR

Fall	
M AP 125, Voice	2
M LT 131, Intro. to Mus. Lit.	3
M TH 143, El. Theory	4
ENG 131, Coll. Rhet.	3
ITAL 131, Beg. Italian	3
Ensemble	1
P.E., Band, or Basic ROTC	1

17

Spring	
M AP 126, Voice	2
M LT 132, Intro. to Mus. Lit.	3
M TH 144, El. Theory	4
ENG 132, Coll. Rhet.	3
ITAL 132, Beg. Italian	3
Ensemble	1
P.E., Band, or Basic ROTC	1

17

SECOND YEAR			
Fall		Spring	
M AP 235, Voice	3	M AP 236, Voice	3
M TH 243, Intermed. Theory	4	M TH 244, Intermed. Theory	4
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
GERM 141, Beg. German	4	GERM 142, Beg. German	4
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
Ensemble	1	Ensemble	1
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
19-20		19-20	
THIRD YEAR			
Fall		Spring	
M AP 345, Voice	4	M AP 346, Voice	4
M TH 333, Form and Comp.	3	M TH 334, Form and Comp.	3
M ED 327, Choral Cond.	2	M LT 330, Vocal Repertoire	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
FREN 141, Beg. French	4	FREN 142, Beg. French	4
Ensemble	1	Ensemble	1
17		18	
FOURTH YEAR			
Fall		Spring	
M AP 445, Voice	4	M AP 446, Voice	4
M TH 435, Counterpoint	3	M TH 427, Instrumentation	2
M LT 431, Hist. of Music	3	M LT 431, Hist. of Music	3
M ED 437, Vocal Pedagogy	3	Elective	3
Ensemble	1	Ensemble	1
14		14	

Applied Music—Wind Instrument or Percussion Curriculum.

FALL		FIRST YEAR		SPRING	
M AP 125, Major Instr.	2	M AP 126, Major Instr.	2	M AP 126, Major Instr.	2
Applied Music (piano)	1	Applied Music (piano)	1	Applied Music (piano)	1
M LT 131, Intro. to Mus. Lit.	3	M LT 132, Intro. to Mus. Lit.	3	M LT 132, Intro. to Mus. Lit.	3
M TH 143, El. Theory	4	M TH 144, El. Theory.	4	M TH 144, El. Theory.	4
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Ensemble	1	Ensemble	1	Ensemble	1
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
15				15	
FALL		SECOND YEAR		SPRING	
M AP 235, Major Instr.	3	M AP 236, Major Instr.	3	M AP 236, Major Instr.	3
M TH 243, Intermed. Theory	4	M TH 244, Intermed. Theory	4	M TH 244, Intermed. Theory	4
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3	GOVT 232, Amer. Govt., Funct.	3
Elective	3	Elective	3	Elective	3
Ensemble	1	Ensemble	1	Ensemble	1
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
18-19				18-19	
FALL		THIRD YEAR		SPRING	
M AP 345, Major Instr.	4	M AP 346, Major Instr.	4	M AP 346, Major Instr.	4
M TH 333, Form and Comp.	3	M TH 334, Form and Comp.	3	M TH 334, Form and Comp.	3
M ED 328, Instr. Cond.	2	HIST 232, Hist. of U.S. since 1877	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3	Elective	6	Elective	6
Elective	3	Ensemble	1	Ensemble	1
Ensemble	1			17	
16					
FALL		FOURTH YEAR		SPRING	
M AP 445, Major Instr.	4	M AP 446, Major Instr.	4	M AP 446, Major Instr.	4
M LT 431, Hist. of Music	3	M LT 432, Hist. of Music	3	M LT 432, Hist. of Music	3
M TH 435, Counterpoint	3	Elective	6	Elective	6
M TH 427, Instrumentation	2	Ensemble	1	Ensemble	1
Elective	3			14	
Ensemble	1				
16					

Applied Music—Stringed Instrument Curriculum.

FIRST YEAR			
Fall		Spring	
M AP 145, Major Instrument	4	M AP 146, Major Instrument	4
M TH 143, Beginning Theory	4	M TH 144, Beginning Theory	4
M LT 131, Intro. to Mus. Lit.	3	M LT 132, Intro. to Mus. Lit.	3
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Elective	1	Elective	1
Ensemble	1	Ensemble	1
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
17		17	

SECOND YEAR

Fall	
M AP 245, Major Instrument	4
M AP 213, Strings	1
M TH 243, Intermed. Theory	4
ENG 231, Mast. of Lit.	3
GOVT 231, Amer. Govt., Org.	3
Elective	1
Ensemble	1
P.E., Band, or Basic ROTC	1-2

18-19

Spring	
M AP 246, Major Instrument	4
M AP 214, Strings	1
M TH 244, Intermed. Theory	4
ENG 232, Mast. of Lit.	3
GOVT 232, Amer. Govt., Funct.	3
Elective	1
Ensemble	1
P.E., Band, or Basic ROTC	1-2

18-19

THIRD YEAR

Fall	
M AP 345, Major Instrument	4
M TH 333, Form and Comp.	3
M ED 328, Instrumental Conducting	2
HIST 231, Hist. of U.S. to 1877	3
Elective	3
Ensemble	1

16

Spring	
M AP 346, Major Instrument	4
M TH 334, Form and Comp.	3
HIST 232, Hist. of U.S. since 1877	3
Elective	3
Ensemble	1

14

FOURTH YEAR

Fall	
M AP 445, Major Instrument	4
M TH 435, Counterpoint	3
M LT 431, Hist. of Music	3
Elective	3
Ensemble	1

14

Spring	
M AP 446, Major Instrument	4
M TH 427, Instrumentation	2
M LT 432, Hist. of Music	3
Elective	3
Ensemble	1

13

Music Education Curriculum.*

FIRST YEAR

Fall	
M AP 125, Prin. Instr.	2
**Applied Music, Sec. Instr.	1
M LT 131, Intro. to Mus. Lit.	3
M TH 143, Ed. Theory	4
ENG 131, Coll. Rhct.	3
Math. or science	3-4
Ensemble	1
P.E., Band, or Basic ROTC	1

18-19

Spring	
M AP 126, Prin. Instr.	2
**Applied Music, Sec. Instr.	1
M LT 132, Intro. to Mus. Lit.	3
M TH 144, Ed. Theory	4
ENG 132, Coll. Rhct.	3
Math. or science	3-4
Ensemble	1
P.E., Band, or Basic ROTC	1

18-19

SECOND YEAR

Fall	
M AP 225, Prin. Instr.	2
**Applied Music, Sec. Instr.	1
M TH 243, Intermed. Theory	4
ENG 231, Mast. of Lit.	3
Foreign Language	4
GOVT 231, Amer. Govt., Org.	3
Ensemble	1
P.E., Band, or Basic ROTC	1-2

19-20

Spring	
M AP 226, Prin. Instr.	2
**Applied Music, Sec. Instr.	1
M TH 244, Intermed. Theory	4
ENG 232, Mast. of Lit.	3
Foreign Language	4
GOVT 232, Amer. Govt., Funct.	3
Ensemble	1
P.E., Band, or Basic ROTC	1-2

19-20

THIRD YEAR

Fall	
M AP 325, Prin. Instr.	2
**Applied Music, Sec. Instr.	1
**Applied Music, Sec. Instr.	1
M TH 333, Form and Comp.	3
M ED 328, Instr. Cond.	2
M ED 338, Sec. Tchg. of Mus.	3
S ED 330, Found. of Sec. Ed.*	3
ED 332, Ed. Psych.	3
Ensemble	1

19

Spring	
M AP 326, Prin. Instr.	2
**Applied Music, Sec. Instr.	1
**Applied Music, Sec. Instr.	1
M TH 334, Form. & Comp.	3
M ED 327, Choral Cond.	2
M ED 336, Sec. Inst. Meth.*	3
HIST 231, Hist. of U.S. to 1877	3
S ED 334, Curric. Devel. in Sec. Ed.	3
Ensemble	1

19

FOURTH YEAR

Fall	
M LT 431, Hist. of Mus.	3
S ED 436, Tchg. in Sec. Schls.*	3
S ED 462, Stud. Tchg. in Sec. Schls.*	6
HIST 232, Hist. of U.S. since 1877	3
Ensemble	1

16

Spring	
M LT 432, Hist. of Mus.	3
M TH 427, Instrumentation	2
Academic electives	6
Free electives	2-4
Ensemble	1

14-16

* Secondary certificate (voice, piano, orchestra, or band instrument). For an all-level (music) certificate, the student should substitute M ED 337 for M ED 336 and substitute either the sequence E ED 3331, ED 332, and E ED 3344; or the sequence E ED 3345, S ED 334, E ED 431, and S ED 432 for that shown above.

** Choice of secondary instrument depends upon the student's principal instrument.

Music Theory Curriculum.

Fall		FIRST YEAR		Spring	
M AP 125, Prin. Instr.	2	M AP 126, Prin. Instr.	2	Applied Music, Sec. Instr.	1
Applied Music, Sec. Instr.	1	M LT 132, Intro. to Mus. Lit.	3	M TH 144, El. Theory	4
M LT 131, Intro. to Mus. Lit.	3	ENG 132, Coll. Rhet.	3	Foreign Language (Fr., Germ., Ital.)	4
M TH 143, El. Theory	4	Ensemble	1	P.E., Band, or Basic ROTC	1
ENG 131, Coll. Rhet.	3				
Foreign Language (Fr., Germ., Ital.)	4				
Ensemble	1				
P.E., Band, or Basic ROTC	1				
		19		19	

Fall		SECOND YEAR		Spring	
M AP 225, Prin. Instr.	2	M AP 226, Prin. Instr.	2	Applied Music, Sec. Instr.	1
Applied Music, Sec. Instr.	1	M TH 244, Intermed. Theory	4	ENG 232, Mast. of Lit.	3
M TH 243, Intermed. Theory	4	Foreign Language (Fr., Germ., Ital.)	3	GOVT 232, Amer. Govt., Funct.	3
ENG 231, Mast. of Lit.	3	GOVT 231, Amer. Govt., Org.	3	Ensemble	1
Foreign Language (Fr., Germ., Ital.)	3	P.E., Band, or Basic ROTC	1-2		
GOVT 231, Amer. Govt., Org.	3				
Ensemble	1				
P.E., Band, or Basic ROTC	1-2				
		18-19		18-19	

Fall		THIRD YEAR		Spring	
M AP 325, Prin. Instr.	2	M AP 326, Prin. Instr.	2	M TH 334, Form & Comp.	3
M TH 333, Form & Comp.	3	M ED 328, Instr. Cond.	2	M TH 436, Counterpoint	3
M ED 327, Choral Cond.	2	HIST 232, Hist. of U.S. since 1877	3	Ensemble	1
M TH 435, Counterpoint	3	Ensemble	1	Music Theory elective	2-3
HIST 231, Hist. of U.S. to 1877	3				
Ensemble	1				
Music Theory elective	2-3				
		16-17		16-17	

Fall		FOURTH YEAR		Spring	
M AP 425, Prin. Instr.	2	M AP 426, Prin. Instr.	2	M LT 432, Hist. of Mus.	3
M LT 431, Hist. of Mus.	3	Academic elective	2	M TH 428, Orchestration	2
Academic elective	3	M TH 433, Fund. of Comp.	3	M TH 431, Ped. of Th. (intermed.)	3
M TH 427, Instr.	2	Ensemble	1		
M TH 432, Fund. of Comp.	3				
M TH 430, Ped. of Th. (elementary)	1				
Ensemble	1				
		17		17	

Piano may be the principal or secondary emphasis, but must be taken four years. Also the student must complete one semester each in the study of three orchestral instruments: strings, woodwinds, brass. This should begin in the first year.

Courses in Applied Music.

Applied music instruction is offered in Baritone, Bassoon, Clarinet, Cornet or Trumpet, Double Bass, Flute, French Horn, Harp, Harpsichord, Oboe, Organ, Percussion, Piano, Saxophone, Trombone, Tuba, Viola, Violin, Violoncello, Voice.

FOR UNDERGRADUATES

- 111, 112, 211, 212. **Keyboard Skills (1:0:2 each).** Sight reading and ensemble skills. Required of all piano majors for 4 semesters.
- 113, 114. **Percussion (1:0:3 each).** Beginning and intermediate experience on the snare drum; introduction to all other percussion instruments, with emphasis on teaching techniques.
- 1113, 1114. **Voice (1:0:3 each).** Correct posture and studies for breath control; development of resonance; study of vowel formation; vocalization. Simple songs. Laboratory ensemble experience.
- 1123, 1124. **Piano (1:0:3 each).** Sight reading and repertoire of simple piano materials. Harmonization and transposition of easy compositions. Laboratory ensemble experience.
- 213, 214. **Strings (1:0:3 each).** Ability to play scales on violin, viola, cello, and bass. Laboratory ensemble experience.
- 2113, 2114. **Voice (1:0:3 each).** Continuation of M AP 1113 and 1114. Laboratory ensemble experience.
- 2123, 2124. **Piano (1:0:3 each).** Continuation of M AP 1123, 1124. Laboratory ensemble experience.
- 313, 314. **Brass Instruments (1:0:3 each).** Fundamentals of playing and teaching brass instruments. Laboratory ensemble experience.
327. **Church Service Playing (2:0:2).** Prerequisite: M AP 226 (Organ) or equivalent. Literature, modulation, improvisation, hymn playing, and transcription for church services.
- 413, 414. **Woodwinds (1:0:3 each).** Fundamentals of playing and teaching woodwinds. Laboratory ensemble experience.
- Applied Music. 115, 116, 215, 216, 315, 316. **Instrument or Voice (1:0:½ each).**
- Applied Music. 125, 126, 145, 146, 225, 226, 235, 236, 245, 246, 325, 326, 345, 346. **Instrument or Voice (2:0:1; 3:0:1; 4:0:1).**

FOR UNDERGRADUATES AND GRADUATES

- Applied Music. 425, 426, 435, 436, 445, 446. **Instrument or Voice (2:0:1; 3:0:1; 4:0:1).**

FOR GRADUATES

530. **Pedagogy of Applied Music (3:3:0).** Advanced study in the pedagogy of applied instrumental or vocal masterworks from easy-moderate to difficult. Emphasis in the pedagogy of interpretation, technique, and memorization.
533. **Applied Music Literature, Graduate Level (3:3:0).** Prerequisite: The undergraduate music literature courses required on the B.M. or B.M.E. degree. Advanced study of literature for the various applied music areas. Individual research projects and class performance.
- Applied Music 535, 545, Instrument or Voice. (3:0:1; 4:0:1).**
660. **Master's Recital and Report (6).** Master of Music Recital: full length program of standard works from the concert repertoire, encompassing several styles of periods of musical composition. Master's Report: a paper of research or documentation of the works performed on the Master of Music Recital.

Courses in Music Education.

FOR UNDERGRADUATES

231. **Music for Classroom Teachers (3:3:0).** Prerequisite: Sophomore standing. For elementary education majors. Rudiments of music using a vocal and keyboard approach. Elementary music reading.
232. **Elementary Music Principles, Practices, and Materials (3:3:0).** Prerequisite: M ED 231 or equivalent. For elementary education majors. Emphasis on music activities for elementary school children.
237. **Choral Methods and Techniques (2:2:0).** Prerequisite: 4 semesters of voice. Fundamental techniques of choral conducting. Rehearsal techniques.
238. **Instrumental Conducting (2:2:0).** Prerequisite: M TH 244 or equivalent. Baton techniques, score reading, and interpretation.
336. **Secondary Instruments and Methods (3:3:0).** Prerequisite: Junior standing and M AP 226. Study of instruments, repertoire, organization, and administration of school instrumental groups.
337. **Elementary School Teaching and Supervision of Music (3:3:0).** Prerequisite: Junior standing. For music majors and minors. Procedures in teaching music in first six grades; selection and presentation of materials.
338. **Secondary School Teaching and Supervision of Music (3:3:0).** Prerequisite: Junior standing. For music majors. Teaching procedures and vocal music materials for junior and senior high school.

FOR UNDERGRADUATES AND GRADUATES

- 413, 423, 434. **Workshop in Elementary School Music (1:0:2; 2:0:4; 3:0:6).** Prerequisite: Junior standing. Music activities for children, emphasizing new techniques and materials. Designed for classroom teachers, music specialists, and public school administrators.
433. **Piano Pedagogy (3:3:0).** Prerequisite: M AP 326 or 346 (Piano). Teaching procedures for prospective piano teachers, including rudiments, techniques, and materials.
437. **Voice Pedagogy (3:3:0).** Prerequisite: M AP 326 or 346 (Voice). Teaching procedures for prospective voice teachers, including exercises, styles, and student teaching.
437. **Choral Conducting (3:2:2).** Prerequisite: Senior classification. Study and performances of representative choral works of all periods. Participation in a major choral organization required. An individual study course.
4318. **Instrumental Conducting (3:2:2).** Prerequisite: Senior classification. Study and performance of instrumental works of all periods. Participation in a major instrumental group required. An individual study course.

FOR GRADUATES

- 530, 531. **Seminar in Music Education (3:3:0 each).** Evaluation of philosophy, curricula, principles, practices, and materials. Special studies allow concentration in the field of the student's major activity.
532. **Choral Music Workshop (3:3:0).** Prerequisite: Departmental approval. Emphasis upon the organization and development of choral organizations in the public schools, including tone production, rhythmic precision, balance, blend, diction. Individual and group project required.
533. **Instrumental Music Workshop (3:3:0).** Departmental approval. Emphasis upon the organization and development of instrumental groups in the public schools, and upon development of performance excellence by these groups.
534. **Marching Band Direction (3:3:0).** Planning, charting, scoring, and rehearsing for marching band shows, contests, and festivals. Study of marching band styles.
537. **Instrumental Repertoire (3:3:0).** Literature for small and large instrumental ensembles.
5335. **Music for Children (3:3:0).** Prerequisite: 6 semester hours in music education or two years' teaching experience in elementary grades. A creative approach to child development through various music activities in grades 1-6.
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required at least twice.

Courses in Music Ensemble.

Each ensemble may be taken for four successive years, since the literature studied will cover a cycle of that period of time. Four semester hours of M EN 113 may be substituted for required physical education.

FOR UNDERGRADUATES

110. Sec. 1. **Tech Choir (1:0:5).** Prerequisite: Audition.
110. Sec. 2. **Women's Chorus (1:0:2).** Prerequisite: Audition.
110. Sec. 3. **Men's Chorus (1:0:2).** Prerequisite: Audition.
110. Sec. 4. **Music Theater (1:0:5).** Prerequisite: Audition.
110. Sec. 5. **Tech Singers (1:0:5).** Prerequisite: Audition.
111. Sec. 1. **Symphony Orchestra (1:0:5).** Prerequisite: Audition.
111. Sec. 2. **Accompanying (1:0:2).**
111. Sec. 3. **Chamber Music (1:0:2).** Restricted to duet, trio, or quartet ensemble.

- 113. Sec. A. Tech Band (1:0:5). Prerequisite: Audition.
- 113. Sec. B. Varsity Band (1:0:3). Prerequisite: Audition.
- 113. Sec. E. Varsity Band (1:0:3).
- 113. Sec. F. Varsity Band (1:0:3).
- 310. Sec. 1. Tech Choir (1:0:5). Prerequisite: Junior standing, audition.
- 310. Sec. 2. Women's Chorus (1:0:2). Prerequisite: Junior standing, audition.
- 310. Sec. 3. Men's Chorus (1:0:2). Prerequisite: Junior standing, audition.
- 310. Sec. 4. Music Theater (1:0:5). Prerequisite: Junior standing, audition.
- 311. Sec. 1. Symphony Orchestra (1:0:5). Prerequisite: Junior standing, audition.
- 311. Sec. 2. Accompanying (1:0:2).
- 311. Sec. 3. Chamber Music (1:0:2).
- 311. Sec. 4. Brass Ensemble.
- 311. Sec. 5. Woodwind Ensemble.
- 313. Sec. A. Tech Band. (1:0:5). Prerequisite: Junior standing, audition.
- 313. Sec. B. Varsity Band. (1:0:3). Prerequisite: Junior standing, audition.
- 313. Sec. C. Stage Band (1:0:3).
- 313. Sec. D. Stage Band (1:0:3).
- 313. Sec. E. Varsity Band (1:0:3). Prerequisite: Junior standing.
- 313. Sec. F. Varsity Band (1:0:3). Prerequisite: Junior standing.

FOR GRADUATES

- 510. Graduate Ensemble (1:0:5). Instruction and demonstration of ensemble technic in performance situations. Preparation of and participation in performed material is required.
- Sec. 1. Chorus
- Sec. 2. Orchestra
- Sec. 3. Band
- Sec. 4. Music Theater
- Sec. 5. Chamber Music
- Military Band. Part of Basic ROTC. For particulars, inquire of the officer in command.

Courses in Music Literature.

FOR UNDERGRADUATES

- 131, 132. Introduction to Music Literature (3:3:0 each). Through directed listening, music of various forms and styles is considered. Introduction to music history showing relationship of music studied to that preceding and following it.
- 238, 239. Heritage of Music (3:3:0 each). For students not majoring in music. Selected compositions will be studied through an interpretation of their historical, functional, and cultural significance.
- 330. Voice Repertoire (3:3:0). Prerequisite: M AP 226 or 236 (Voice). Survey of song repertoire for all voices. Class performance and listening.
- 331. Music Literature (3:3:0). For elementary education majors specializing in music. Media, styles, and forms of various periods. Material for elementary grades.
- 431, 432. History of Music (3:3:0 each). Prerequisite: Junior standing. A stylistic and biographical study of the major periods, medieval to modern, through records, scores, and bibliography. Performance practices, aesthetics. Relationship to art, literature, and philosophy and to social and political history.

FOR UNDERGRADUATES AND GRADUATES

- 435, 436. Keyboard Literature (3:3:0 each). A survey of keyboard literature from earliest times to the present. Class performance and listening.
- 435. Music in the General Culture (3:3:0). Prerequisite: Junior standing. Not open to music majors. A study of musical works in all styles.

FOR GRADUATES

- 531. Seminar in Music Literature (3:3:0). The study of music as an academic discipline. Musicological orientations: systematic vs. historical. Scholarly principles applied to selected topics within the fields of music literature, history, aesthetics, and criticism.
- 532. Choral Repertoire (3:3:0). Analysis of choral works of all periods for both small and large ensembles.

Courses in Music Theory.

FOR UNDERGRADUATES

- 131. Introduction to Music Theory (3:3:0). Emphasis on simple melody, rhythm, harmony, singing, and keyboard studies.
- 135, 136. Fundamentals of Music (3:3:0 each). For elementary education majors specializing in music. Sight-singing in unison and parts, melodic and harmonic dictation, keyboard work; major and minor keys; primary and secondary chords; modulations to related keys.
- 143, 144. Elementary Theory (4:3:2 each). Melody, intervals, four-voice chords and non-harmonic material in major and minor tonalities; modulation; keyboard; sight-singing; melodic and harmonic dictation.
- 243, 244. Intermediate Theory (4:3:2 each). Prerequisite: M TH 144 or equivalent. Analysis, written work, keyboard and dictation in four-voice texture including diatonic and altered triads, sevenths, Augmented Sixths; small contrapuntal forms; sight-singing.

FOR UNDERGRADUATES AND GRADUATES

- 321. Score-Reading (2:2:0). Prerequisite: Junior classification. Reading of open score (piano score, string quartet, octavo, full orchestra) at the piano. Comprehension of clefs and instrumental transpositions are involved.
- 331. Arranging (3:3:0). Techniques of band arranging; jazz idioms; arranging for small combo and stage band; laboratory performances of student arrangements.
- 333, 334. Form and Composition (3:3:0 each). Prerequisite: M TH 244 or equivalent. Homophonic and larger forms; analysis and synthesis of Classical, Romantic, Impressionist and Contemporary styles; harmonic and non-harmonic elements; analysis-performance reports.
- 427, 428. Instrumentation, Orchestration (2:2:0 each). Prerequisite: M TH 244 or equivalent. Properties of woodwind, brass, string, and percussion instruments; transposition; techniques and mechanics of scoring within sections leading to full orchestral and band scoring.
- 430, 431. Pedagogy of Theory (3:3:0 each). Prerequisite: Senior or graduate classification. Study of the correlation of dictation, written harmony, keyboard, and singing at the collegiate level; formation of syllabus; observation; practice teaching.

- 432, 433. **Fundamentals of Composition (3:3:0 each)**. Prerequisite: Senior or graduate classification. Original writing in small forms for voice, solo instruments, and small ensembles; development of individual style. Select student works may be performed during the annual Festival of Contemporary Music.
- 435, 436. **Modal Counterpoint (3:3:0 each)**. Prerequisite: MTH 244 or equivalent. Vocal counterpoint of sixteenth century; mass motet, madrigal; solo vocal writing in the modes; synthesis in two-to-six-voice textures; group sight-reading of the literature.

FOR GRADUATES

531. **Seminar in Music Theory (3:3:0)**. Prerequisite: Senior or graduate classification. History of musical practice; survey of theoretical texts, treatises, and materials from pre-Baroque to the present.

Department of Philosophy

The Department of Philosophy directs the *Bachelor of Arts* degree program in PHILOSOPHY.

Students majoring in philosophy must complete 30 semester hours in philosophy, including PHIL 231. Minors are required to complete 18 semester hours in philosophy. A grade of C or better must be earned by majors or minors in each course in philosophy at the 300 level or above.

A maximum of 6 semester hours of credit toward a major in philosophy may be allowed for advanced courses in certain other departments provided the chairman of the departments concerned approve the student's program.

Courses in Philosophy.

FOR UNDERGRADUATES

230. **Introduction to Philosophy (3:3:0)**. Prerequisite: Sophomore classification. Problems in interpretation of the nature of knowledge, reality, and value.
231. **Introduction to Logic (3:3:0)**. Prerequisite: Sophomore classification. Introduction to deductive methods. Supplementation of Aristotelian principles with Boolean techniques and the rudiments of symbolic calculi.
238. **Ethics (3:3:0)**. Prerequisite: Sophomore classification. Problems of individual and social conduct.

FOR UNDERGRADUATES AND GRADUATES

331. **History of Ancient and Medieval Philosophy (3:3:0)**. Prerequisite: Junior classification. Philosophical thought from Thales to the Scholastics, with emphasis upon Plato, Aristotle, Augustine, and Aquinas.
332. **History of Modern Philosophy (3:3:0)**. Prerequisite: Junior classification. Philosophical thought from Descartes through Hegel. Continental rationalism, British empiricism, and German idealism examined carefully.
333. **Development of American Philosophy (3:3:0)**. Prerequisite: Junior classification. American philosophy from colonial times to the present.
334. **Contemporary Philosophy (3:3:0)**. Prerequisite: Junior classification. Philosophical thought of the neo-Kantians, vitalists, neo-Hegelians, pragmatists, neo-realists, and positivists.
335. **Oriental Philosophies (3:3:0)**. Prerequisite: Junior classification. Views of important philosophic thinkers of the Orient; emphasis upon those of China and India.
336. **Philosophy of Science (3:3:0)**. Prerequisite: Junior classification. Investigation of selected concepts of the natural sciences and of their relations to empirical observation and confirmation.
338. **Intermediate Logic (3:3:0)**. Prerequisite: PHIL 231 or MATH 136 or its equivalent and junior classification. A continuation of PHIL 231, with special emphasis on functional calculus, set theory, and postulational technique.
431. **Aesthetics (3:3:0)**. Prerequisite: Senior classification or consent of instructor. The nature of beauty; analysis of the aesthetic experience.
432. **Philosophy of Value (3:3:0)**. Prerequisite: Senior classification or consent of instructor. The nature of values; exploration of the possibility of an integrated value system.
433. **Theories of Knowledge (3:3:0)**. Prerequisite: 6 hours of philosophy and senior classification or consent of instructor. Examination of the presuppositions for reliable knowledge.
434. **Metaphysics (3:3:0)**. Prerequisite: 6 hours of philosophy and senior classification or consent of instructor. Studies in rival ontologies and their relevance to current inquiry.
436. **Philosophy of Religion (3:3:0)**. Prerequisite: Senior classification or consent of instructor. Historical and contemporary religious movements.
438. **Seminar in Philosophical Problems (3:3:0)**. Prerequisite: Senior classification and major or minor in philosophy. Readings on selected topics, reports, and conferences.

FOR GRADUATES

531. **Studies in Philosophical Classics (3:3:0)**. Prerequisite: Graduate classification or consent of instructor. Special studies in philosophical classics. Independent work under a staff member with prior permission. May be repeated.
535. **Basic Issues in Contemporary Philosophy (3:3:0)**. Prerequisite: Consent of instructor. Certain topics around which philosophical controversies emerge: rational and empirical knowledge; science and value; etc. Designed for graduate education students, but open to others.

Department of Physics

This department supervises the following degree programs: **ENGINEERING PHYSICS**, *Bachelor of Science in Engineering Physics* (offered in conjunction

with the School of Engineering); PHYSICS, *Bachelor of Arts* or *Bachelor of Science, Master of Science, Doctor of Philosophy*.

The undergraduate curricula in physics may lead to either a Bachelor of Arts degree or Bachelor of Science degree; the curricula in Engineering Physics, offered in conjunction with the School of Engineering, leads to a Bachelor of Science in Engineering Physics degree. The curriculum for the Bachelor of Science degree is set forth in the accompanying table; that for the Bachelor of Science in Engineering Physics appears in the appropriate section of the School of Engineering.

In fulfilling degree requirements, majors in this department must have a grade average of 2.00 in physics courses, with at least 36 semester hours of physics in which a grade of C or better was received, and must meet the general requirements of the degree they are seeking, as described in this catalog.

Teacher Education. For those students seeking secondary certification to teach physics and other sciences, the following physics courses are required:

I. For students following Plan I (two teaching fields of 24 semester hours each): PHYS 143, 241, 242, 314, 315, 335, 336, plus 6 hours from the following: PHYS 331, 337, 338, 341, 432, 434, 435, 439.

II. Science option: Students may elect a broad field science option (Plan II). Work must be distributed in at least three of the science departments—biology, chemistry, geosciences, and physics. Not more than 8 hours may be in geosciences. The student electing this option should consult the Chairman of the Physics Department and should become familiar with the Teacher Education section of the catalog.

Physics Curriculum, B.S. Degree.

FIRST YEAR			
Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
PHYS 143, Prin. of Physics	4	PHYS 241, Prin. of Physics	4
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
	17		17
SECOND YEAR			
Fall		Spring	
PHYS 242, Prin. of Phys.	4	PHYS 331, Optics	3
MATH 235, Anal. Geom. & Calc. III	3	MATH 335, Higher Math for	
ENG 231, Mast. of Lit.	3	Engrs. & Scits. I	3
Science elective	3-4	ENG 232, Mast. of Lit.	3
GERM 141, Beg. Germ. or		GERM 142, Beg. Germ. or	
FREN 141, Beg. Fren.	4	FREN 142, Beg. Fren.	4
P.E., Band, or Basic ROTC	1-2	Science elective	3-4
	18-20	P.E., Band, or Basic ROTC	1-2
			17-19
THIRD YEAR			
Fall		Spring	
PHYS 314, Intermed. Lab.	1	PHYS 315, Intermed. Lab.	1
PHYS 335, Elec. & Magnetism	3	PHYS 336, Elec. & Magnetism	3
PHYS 434, Mechanics	3	PHYS 435, Mechanics	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
GERM 233, Scientific Germ. or		GERM 234, Scientific Germ. or	
FREN 231, Sec. Course in French	3	FREN 232, Sec. course in French	3
MATH 336, Higher Math. for		Social science elective	3
Engrs. & Scits. II	3		
	16		16
FOURTH YEAR			
Fall		Spring	
PHYS 432, Thermodynamics	3	Social Science elective	3
PHYS 437, Quantum Mech.	3	PHYS 338, Nuc. Phys.	3
MATH 434, Adv. Calculus	3	MATH 435, Adv. Calculus	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
Humanities elective	3	Humanities elective	3
	15		15

Science electives to be chosen from courses offered in biology, chemistry, or geosciences department.

See approved list of social sciences and humanities electives in the departmental office.

Any deviations from prescribed course requirements must be approved by the department chairman.

Courses in Physics.

FOR UNDERGRADUATES

- 141, 142. **General Physics (4:3:3 each)**. A general course in beginning physics covering mechanics, heat, sound, electricity and magnetism, light, and modern physics.
143. **Principles of Physics I (4:3:3)**. Prerequisite: Parallel enrollment in MATH 151. Kinematics, dynamics, conservation laws, wave motion, fluids, kinetic theory, and thermodynamics.
237. **Techniques of Photography (3:2:3)**. Prerequisite: Sophomore standing and approval of instructor. Fundamental processes and techniques of photography for those who will later need photography as a scientific tool. Will not apply toward physics requirements.
241. **Principles of Physics II (4:3:3)**. Prerequisite: PHYS 143 and parallel enrollment in MATH 152. Electric and magnetic fields, dielectrics, magnetic properties of materials, electromagnetism, geometrical and physical optics.
242. **Principles of Physics III (4:3:3)**. Prerequisite: PHYS 241. Study of atomic and nuclear phenomena.
- 312, 313. **Atomic and Nuclear Physics Laboratory (1:0:3 each)**. Prerequisite: PHYS 242 or parallel enrollment in PHYS 337, 338. Approval of instructor. Credit for either or both semesters.
- 314, 315. **Intermediate Laboratory (1:0:3 each)**. Prerequisite: PHYS 143, 241, 242 or equivalent and junior standing. Laboratory course in basic physical principles.
331. **Optics (3:2:3)**. Prerequisite: PHYS 143, 241, 242. Major emphasis on physical optics.
- 335, 336. **Electricity and Magnetism (3:3:0 each)**. Prerequisite: One year of physics and junior standing. Electrostatics, dielectric theory, Laplace's equation, transient and A.C. circuits, magnetic fields, vector potential, magnetic materials, and electromagnetic theory.
337. **Introduction to Atomic Physics (3:3:0)**. Prerequisite: One year of physics and junior standing.
338. **Introduction to Nuclear Physics (3:3:0)**. Prerequisite: One year of physics and junior standing.
341. **Electronics (4:3:3)**. Prerequisite: PHYS 335. General course in electronics stressing the fundamentals of electron behavior in areas of primary importance in the physical sciences.

FOR UNDERGRADUATES AND GRADUATES

422. **Selected Topics (2:2:0)**. Prerequisite: Approval of department chairman. Lecture course in topics selected either by student request or departmental recommendation and given when deemed necessary. May be repeated in different areas.
432. **Thermodynamics (3:3:0)**. Prerequisite: PHYS 143, 241, and 242, or equivalent, and differential equations. First and second laws of thermodynamics, entropy, equations of state, thermodynamics functions.
- 434, 435. **Mechanics (3:3:0 each)**. Prerequisite: PHYS 143, 241, and 242, or equivalent, and differential equations. Statics, kinematics, and dynamics of rigid bodies, including Euler's equations damped and forced vibrations, Lagrange's equations, Hamilton's equations, special relativity.
436. **Individual Study of Specified Fields (3:1:4)**. Prerequisite: Approval of department. Individual student study of theoretical or experimental projects under the guidance of a member of the staff. May be repeated in different areas.
- 437, 438. **Quantum Mechanics (3:3:0 each)**. Prerequisite: Differential equations. The Schrodinger equation, matrix representations, approximation methods, and scattering with applications in contemporary physics.
439. **Solid-State Physics (3:3:0)**. Prerequisite: PHYS 335, 336, and differential equations or consent of department chairman. Specific heats of solids, ionic conductivity, ferro-electronics, band theory of solids, semiconductors and transistors, ferro-magnetism.
4121. **Engineering Physics Seminar (1:1:0)**. Prerequisite: Approval of department. Investigation and study of engineering problems of special interest and value to the student. May be repeated for credit.

FOR GRADUATES

- 511, 512. **Seminar (1:1:0 each)**. Required of all graduate students.
513. **Techniques of Experimental Physics (1:0:3)**. Prerequisite: Graduate standing in physics. The use and development of experimental apparatus, design of experiments, treatment of data.
530. **Advanced Topics (3:3:0)**. Prerequisite: Graduate standing and approval of department chairman. Advanced topics selected by departmental recommendation. May be repeated in different areas.
535. **Introduction to Statistical Physics (3:3:0)**. Prerequisite: PHYS 432, 437, and 438; enrollment in PHYS 438 may be parallel. Elements of probability theory and statistics; conceptual foundation of kinetic theory. Gibbs's statistical mechanics, the method of Darwin and Fowler, derivation of the laws of macroscopic thermodynamics from statistical considerations; other selected applications in both classical and quantum physics.
536. **Advanced Dynamics (3:3:0)**. Prerequisite: PHYS 541 or consent of instructor.
- 541, 542. **Theoretical Physics (4:4:0 each)**. Introduction to contemporary methods of mathematical physics. Classical vectorial and analytical mechanics, special theory of relativity, classical field theory, partial differential equations of physics, boundary value problems, and elementary quantum mechanics. Theoretical foundations of current departmental research fields are developed.
631. **Master's Thesis (3)**. Enrollment required at least twice.
- 633, 634. **Quantum Mechanics (3:3:0 each)**. Prerequisite: PHYS 437, 438, and 541, 542. Review of formal theory of quantum mechanics; quantum theory of angular momentum; relativistic wave equations, formal theory of scattering, including S-Matrix theory; quantum theory of fields, including quantum electrodynamics theory of weak interactions, theory of strong interactions, and dispersion relations.
- 635, 636. **Electromagnetic Theory (3:3:0 each)**. Prerequisite: MATH 434, 435, PHYS 335, 336. Advanced treatment of Maxwell's theory, including electrostatics, magnetostatics, theory of radiation, and application of the theory to select contemporary problems.
- 637, 638. **Structure of Matter (3:3:0 each)**. Prerequisite: Departmental approval. Contemporary concepts of the structure of material and the empirical evidence supporting these concepts. Atomic structure, molecular structure, nuclear structure, sub-nuclear particles; the gaseous, liquid, and solid states; transitions between states. A mature mathematical treatment.

639. **Advanced Statistical Physics (3:3:0)**. Prerequisite: PHYS 535. Advanced application of statistical methods to problems of transport phenomena, non-equilibrium thermodynamics, imperfect gases, phase transitions, and quantum fluids.
- 733, 734. **Advanced Solid State Physics (3:3:0 each)**. Prerequisite: Departmental approval. A professional level course covering both experimental and theoretical aspects of solid state physics.
- 735, 736. **Atomic and Molecular Spectra (3:3:0 each)**. Prerequisite: Departmental approval. A professional level course covering both experimental and theoretical aspects of atomic and molecular structure.
- 737, 738. **Advanced Topics in Theoretical Physics (3:3:0 each)**. Prerequisite: Departmental approval. Current topics in theoretical physics, which may include application of group theory, quantum mechanics of many-body systems, theory of elementary particles, general relativity, and theory of plasmas.
739. **Individual Study (3:1:4)**. Prerequisite: Departmental approval. Theoretical or experimental study in problems of current interest. May be repeated for credit.
- 7311, 7312. **Advanced Nuclear Physics (3:3:0 each)**. Prerequisite: PHYS 437, 438. A professional level course covering both experimental and theoretical aspects of nuclear physics.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Department of Psychology

This department supervises the following degree programs: **PSYCHOLOGY, Bachelor of Arts, Master of Arts, Doctor of Philosophy.**

The advanced degrees encompass a number of different areas in counseling, clinical, and experimental psychology. In addition, there is a graduate program for those wishing to earn a professional certificate in school counseling and guidance.

All undergraduate majors in psychology are required to take a core program of six courses with an additional four courses on a partial option basis. The required courses are PSY 230, 240, 437, 4316, 4317, and MATH 4328. Of the optional courses two must be taken from PSY 434, 435, or 436 and two from 433, 4322, 4323, or 4327. Psychology majors may take additional courses in the department to total 42 hours if they so desire.

Grades below C will not be acceptable for fulfillment of either major or minor requirements.

Courses in Psychology.

FOR UNDERGRADUATES

230. **General Psychology I (3:3:0)**. Introduction to fundamental concepts in psychology. Emphasis on heredity and environment, individual differences, personality dynamics, and group processes.
240. **General Psychology II (4:3:2)**. Emphasis on experimental psychology, learning perception, motivation, and the biological bases of behavior. Introduction to laboratory approaches in the study of behavior.
330. **Psychology in Business and Industry (3:3:0)**. Prerequisite: PSY 230 or 240. Basic psychological principles of behavior in the management of personnel.
331. **Child Psychology (3:3:0)**. Prerequisite: PSY 230 or 240, or ED 332, or CDFR 131. Emphasis is placed upon the development of the child from 6 to 12. A study of the developmental processes and environmental factors which shape the personality and affect the achievement of the child.
332. **Mental Health (3:3:0)**. Prerequisite: PSY 230 or 240, or ED 332 or CDFR 131. A study of the individual and social factors which contribute to the development of both healthy and unhealthy personalities.
335. **Adolescent Psychology (3:3:0)**. Prerequisite: PSY 230 or 240, or ED 332, or CDFR 131. A general review of approaches to the understanding of social behavior and development of the adolescent. Physical, mental and emotional growth and adjustment are covered.
343. **Statistical Methods (4:3:2)**. Prerequisite: PSY 230 or 240, or ED 332. Introduction to descriptive and inferential statistics through T test and Chi-square. Emphasis is placed on statistical foundations in set and probability theory. Practice on calculators and introduction to computer functions.

FOR UNDERGRADUATES AND GRADUATES

432. **Personnel Testing (3:2:3)**. Prerequisite: PSY 330 or equivalent. The principles and methods of test construction and test administration. Survey of the practical fields of personnel measurement, including specific aptitudes and achievement, interest, and personality dimensions. Fee \$2.
433. **Intermediate Quantitative Methods in Psychology (3:3:0)**. Prerequisite: MATH 4328 or equivalent. Review of inferential statistics including probability, small sample theory, and Chi-square. Advanced treatment of analysis of variance, nonparametric statistics and correlational methods. Emphasis will be upon application to problems of behavioral sciences.
434. **Introduction to Social Psychology (3:3:0)**. Prerequisite: PSY 230 or 240. Study of individual experience and behavior in relation to social stimulus situations. Survey of experimental work and reports on current problems.
435. **Abnormal Psychology (3:3:0)**. Prerequisite: 6 hours of psychology. Personality deviations and maladjustments; emphasis on clinical descriptions of abnormal behavior, etiological factors, manifestations, interpretations, and treatments.
436. **Personality Development (3:3:0)**. Prerequisite: 6 hours of psychology. Principles of normal personality structure. Designed to meet the practical needs of teachers, personnel workers, counselors, clinical psychologists, and others who are interested in guidance and the understanding of personality organization.

437. **Experimental Psychology (3:2:3)**. Prerequisite: PSY 230, 240, MATH 4328 or equivalents. A lecture-laboratory course considering the problems of experimentation in clinical, social, and experimental psychology upon animals and human subjects.
439. **Industrial Psychology (3:3:0)**. Prerequisite: PSY 230 or 330. Psychological principles and methods applied to industry.
4314. **The Human Element in Engineering (3:3:0)**. Prerequisite: PSY 230 or 330. Recommended: MATH 4238. Introduction to human factors and their function in man-machine systems. Emphasis is on the perceptual and work capacities of man in relation to various task situations.
4316. **History of Psychology (3:3:0)**. Prerequisite: PSY 230, 240 or equivalent. Recommended: senior standing. A survey of the history of psychology, with emphasis on the evolution of contemporary viewpoints and methods.
4317. **The Psychology of Learning (3:3:0)**. Prerequisite: PSY 230, 240 or equivalent. A critical survey of methods, results, and interpretations of human and animal studies with emphasis on understanding the basic concepts and terms employed in this area. Brief survey of theories.
4318. **Industrial Training (3:3:0)**. Prerequisite: PSY 330. Principles of teaching and learning; selecting instructional staff; organization and coordination of training functions.
4319. **Human Learning (3:3:0)**. Prerequisite: PSY 230 or ED 332. An investigation of the research dealing with human learning, particularly in relation to education, training, and conditioning. Emphasis will be on higher types of problem solving, programmed instruction, retention, motor skills, and language skills. Applied emphasis.
4321. **Interviewing Principles and Practices (3:3:0)**. Prerequisite: 6 hours of psychology and/or consent of instructor. Review of principles. Emphasis on skill which will apply directly to interview situations, such as industrial, clinical, and vocational counseling. Demonstration, recordings, and discussion.
4322. **Motivation (3:3:0)**. Prerequisite: 6 hours of psychology. An analysis of current theories in motivation and their historical development. Emphasis on recent empirical findings in the areas of primary and derived motivational states and their influence on theory. Animal and human.
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 230, 240, and consent of instructor. This course represents an emergent synthesis of the traditional areas of perception, learning, and human performance. This new area concerns itself with higher level human cognition. Data and theory for the topics of creativity, concept learning, cognitive skills, and attention will be covered.
4326. **Individual Problems Course (3)**. Prerequisite: Prior permission of instructor and high scholastic achievement. Independent work under the individual guidance of a staff member.
4327. **Physiological Psychology (3:3:0)**. Prerequisite: 6 hours of psychology. Recommended: BIOL 142, PSY 240 or equivalent. Introduction to neuroanatomy, electro-physiological measuring techniques, and the mechanisms of receptor and effector systems. A study of the relationship between behavior and the physiological substrate.

FOR GRADUATES

532. **Problems in Psychology (3)**. Prerequisite: 12 advanced hours of psychology and prior permission of instructor. Independent work under individual guidance of a staff member.
534. **Practicum in Psychological Testing (3:3:0)**. Prerequisite: Permission of instructor. Instruction and practice in giving intelligence, aptitude, interest, and/or personality tests. Emphasis on individual tests.
539. **Occupational Information and Career Patterns (3:3:0)**. Prerequisite: Graduate standing. Historical development of counseling movement, ethical factors in counseling; work and labor trends; collection, classification, and utilization of educational and vocational information for counseling purposes. Analysis of career patterns.
5311. **Projective Techniques I (3:3:0)**. Prerequisite: PSY 534, and permission of instructor. Psychological principles and theories of perception, motivation, and related topics as applied to projective methods. Study and administration of specific projective tests.
5312. **Projective Techniques II (3:3:0)**. Prerequisite: PSY 5311, and permission of instructor. Study, administration, and interpretation of selected projective techniques: Rorschach and TAT.
5314. **Tests and Measurements (3:3:0)**. Prerequisite: MATH 4328 or equivalent. Instruction and supervised practice in planning a testing program; selection, administration, scoring, and interpretation of individual and group tests, including intelligence, achievement, aptitude, and personality tests.
5316. **Introduction to Adjustment Counseling and Psychotherapy (3:3:0)**. Prerequisite: PSY 435 or 436. Consideration of theories of adjustment counseling. Attitudes and orientation of the counselor in the counseling relationship, oral discussion, recordings, and role playing.
5317. **Techniques of Counseling: Career Guidance (3:3:0)**. Prerequisite: PSY 534, 5316. Theories of educational-vocational counseling, utilization of tests for counseling purposes; emphasis on techniques of counseling; counseling experience; report writing.
5318. **Practicum in Techniques of Counseling (3:2:3)**. Prerequisite: Prior permission of instructor. Supervised experience in interviewing, adjustment counseling, vocational counseling and/or psychological evaluation. Student works with a limited number of clients through the psychology clinic.
5323. **Group Counseling and Psychotherapy (3:3:0)**. Prerequisite: Prior permission of instructor. Designed to provide theories of approaches to group work and a personal experience with group processes. Various points of view will be studied.
5324. **Seminar in Personality Theory (3:3:0)**. Prerequisite: PSY 436. A critical review of current theories of personality.
5325. **Case Studies in Vocational Rehabilitation (3:3:0)**. Prerequisite: Prior permission of instructor. Critical analysis of actual cases derived from the files of the State Office of Rehabilitation and the State Commission for the Blind.
5326. **Medical Aspects of Rehabilitation (3:3:0)**. Prerequisite: Prior permission of instructor. A joint medical-psychological seminar considering medical aspects and psychological components of disabling diseases and the interaction of these two factors as the individual reacts to the residual handicap. Rehabilitation emphasis.

5327. **The Psychology of Disability (3:3:0)**. Prerequisite: Prior permission of instructor. A medical psychological approach to rehabilitation of the disabled. Special emphasis upon attitudes toward disability, social and psychological implication of mental and physical disabilities as related to the client's self concept, and attitudes of the community toward the client.
5328. **Seminar in Social Psychology (3:3:0)**. Prerequisite: PSY 434. Contemporary attitude theory and research; systematic theory in social psychology; social structure and personality; the psychology of social movements and current research trends.
5334. **Advanced Counseling Psychology (3:3:0)**. Prerequisite: PSY 539 and 5318. Consideration of theories of vocational development and theories of counseling. Discussion of professional issues and problems related to the area of counseling psychology.
5336. **Advanced Child Psychology (3:3:0)**. Prerequisite: Prior permission of instructor. A course dealing with mental, motor, social, and emotional development of elementary school age children. Effects of environment in producing emotional disturbances.
5337. **Play Therapy (3:3:0)**. Prerequisite: Prior permission of instructor. Study of theory and application of play techniques in diagnostic and therapeutic work with children; the child's symbolic communications through languages, art, and play materials. Review of research.
5338. **Seminar in Psychopathology (3:3:0)**. Prerequisite: PSY 435 or equivalent. Advanced study in the area of abnormal or deviant forms of behavior, including both functional and organic conditions.
5343. **Seminar in Psychometrics (3:3:0)**. Prerequisite: PSY 5314, 5347, 5348 or consent of instructor. Analyse methodological and theoretical problems in measurement and test construction.
5345. **Research Seminar in Clinical and Counseling Psychology (3:3:0)**. Prerequisite: PSY 5347 and 5348. Survey of methods and approaches to research in these areas.
5346. **Seminar in Human Factors (3:3:0)**. Prerequisite: PSY 5347, 5348, 5351, or permission of instructor. Intensive analysis of concepts associated with human factors research and theory. Original research problems will be developed by the student.
5347. **Advanced Correlational Methods and Factor Analysis (3:3:0)**. Prerequisite: Permission of instructor. Comprehensive survey of multi-variance analysis including multiple correlation and factor analysis and other correlational techniques. Review of analysis of co-variance.
5348. **Advanced Statistical Methods and Experimental Design (3:3:0)**. Prerequisite: Permission of instructor. Logical principles governing sound experimentation: Conventional designs utilizing analysis of variance. Introduction to complex analysis of variance designs, trend tests, and analysis of co-variance.
5349. **Seminar in the Teaching of Psychology (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. Study of methods applied to teaching at the college level. Preparation of course materials, presentation, audio-visual aids, etc. May not be used as part of degree program.
5351. **Advanced Experimental Psychology (3:3:0)**. Prerequisite: PSY 437, 5347 and 5348. Advanced research techniques; each class member required to design, execute, and write up one or more original experiments. Study of methodological problems in research.
5352. **Seminar in Learning Theory (3:3:0)**. Prerequisite: PSY 4317. Current systems and theories of learning.
5353. **Seminar in Physiological Psychology (3:3:0)**. Prerequisite: PSY 4327 or equivalent. Open to graduate students in the biological sciences with credit in PSY 230 or equivalent. Current trends in psycho-physiological research.
5354. **Seminar in Perception (3:3:0)**. Prerequisite: PSY 4323 or prior permission of instructor. Major problems areas in psychology of perception, such as the study of the psycho-physiology of sensory processes; perception theory; implication theory; implications for usage in social and clinical psychology.
5355. **Seminar in Comparative Psychology (3:3:0)**. Prerequisite: Prior permission of instructor. Study of the use of subhuman organisms in psychological research. Emphasis on modifiability of behavior as a function of phylogenetic level, social structure of animal groups, instincts, imprinting, and learning.
5356. **Seminar in Motivation (3:3:0)**. Prerequisite: PSY 4322 or prior permission of instructor. Study of psychological, social and physiological factors in motivation. Human and animal.
5357. **Seminar in Quantitative Learning Theory (3:3:0)**. Prerequisite: PSY 5348 and 5352. Analytical techniques and their application to the formulation, experimental evaluation, and revision of mathematical models of learning in representative areas of choice, paired-associate, avoidance, stimulus sampling, probability learning, and related topics.
5358. **Electrophysiological Techniques (3:3:0)**. Prerequisite: PSY 4327 or prior permission of instructor. Experimentation and methodology using polygraph, EEG equipment, and psycho-physiological measurement. Relevant to graduate majors in physiology or bio-physics.
5359. **Advanced General Psychology (3:3:0)**. Prerequisite: Prior permission of instructor. Advanced study in general psychology. Review of relevant literature.
5360. **Seminar in Verbal Behavior (3:3:0)**. Prerequisite: Graduate standing and the consent of instructor. Study of the problems of the acquisition of language, symbolic communication, information processing, and the learning of verbal material. Psycholinguistics, Information Theory, and Meaningfulness.
5361. **Advanced Practicum in Counseling and Clinical Psychology (3:1:3)**. Prerequisite: PSY 5318, and prior permission of instructor. Supervised practice in psychodiagnostics and psychotherapy with selected cases. Emphasis on a wide variety of experience. May be repeated.
5362. **Master's Internship in Counseling and Clinical Psychology (3)**. Prerequisite: By arrangement with department chairman. Full-time supervised internship in an appropriate facility.
5363. **Doctoral Internship in Counseling and Clinical Psychology (3)**. Prerequisite: By arrangement with department chairman. Full-time supervised internship in an appropriate facility. Enrollment required four times to complete one calendar year.
630. **Master's Report (3)**.
631. **Master's Thesis (3)**. Enrollment required at least twice.
- 731, 732. **Research (3 each)**.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Department of Sociology and Anthropology

This department supervises the following degree programs: **ANTHROPOLOGY, Bachelor of Arts; SOCIOLOGY, Bachelor of Arts, Master of Arts.** The department also participates in the **LATIN AMERICAN AREA STUDIES** program leading to the *Bachelor of Arts* degree.

A student majoring in sociology must complete 30 semester hours in sociology, including the following courses: 230, 233, 436, 439, 4316. He must receive a grade of C or better in each advanced course in sociology (all courses having a 300 number or higher) if he wishes to have it count toward a major or minor in sociology.

A student majoring in anthropology must complete 30 semester hours in anthropology, including ANTH 231, 232, 332, one course in prehistory, and two courses in ethnology. SOC 336, PHIL 436, and HIST 4329 (Plains Indians) may be credited toward a major in anthropology. A grade of C or better must be received in each advanced anthropology course (all courses having a number of 300 or higher) by those working for a major or minor in the subject.

Sociology may be used as a social science in the broad field (Plan II) program for secondary teacher certification and as a field of specialization in elementary education. For specific courses consult the chairman of the department.

Courses in Sociology.

FOR UNDERGRADUATES

- 230. **Introduction to Sociology (3:3:0).** Introduction to the study of human group behavior, including the forms which group life takes, the relationships of groups to other groups, the influence of groups on the individual, and the relationships of individuals to each other as members of groups.
- 233. **Current Social Problems (3:3:0).** Prerequisite: SOC 230 or consent of instructor. The application of the principles of group behavior and organization (as learned in SOC 230) to the analysis of problems in such basic social institutions as marriage and the family, the community, the economy, government, education, health and welfare, recreation, etc.
- 234. **Social Welfare as an Institution (3:3:0).** Prerequisite: SOC 230 and 233. An examination of factors influencing the development of welfare services within the United States with particular emphasis upon emerging governmental programs.
- 235. **The Sociology of Marriage (3:3:0).** History, present status, and current problems of the marriage institution.
- 331. **Rural Sociology (3:3:0).**
- 332. **Introduction to Health and Welfare Services (3:3:0).** Prerequisite: SOC 234 or consent of instructor. An examination of the functions, goals, and purposes of selected health and welfare agencies found within the modern American community.
- 333. **Field Experience in Social Work (3:3:0).** Prerequisite: SOC 234 and 332. This course provides the student with closely supervised experience in a social welfare or related agency.
- 334. **The Sociology of Work and Industrial Relations (3:3:0).** An analysis of the social organization of industrial concerns, social relationships among employees, and problems of morale and efficiency; focus on occupational careers—in terms of their societal context and as personal techniques of social adaptation.
- 336. **Society and Culture of Mexico (3:3:0).**
- 339. **Sociology of Leisure (3:3:0).** Prerequisite: SOC 230 or consent of instructor. Sociological study of leisure. Attitudes and conceptions of leisure as developed in primitive and historical societies. Relation of leisure to other aspects of social life, such as work, art, morality, and other institutions. Current social and technological influences on American leisure patterns.

FOR UNDERGRADUATES AND GRADUATES

- 433. **Criminology (3:3:0).** Prerequisite: SOC 230 or consent of instructor.
- 434. **Sociology of the Developing Nations (3:3:0).** Prerequisite: Advanced undergraduate or graduate standing. Study of the sociological problems faced by developing nations as they enter the urban, industrial, and scientific age.
- 435. **Collective Behavior and Social Movements (3:3:0).** Prerequisite: SOC 230 or consent of instructor. Spontaneous group behavior—that which is not organized as a part of the culture and social organization of the group: crowds and mobs, publics and public opinion, and mass behavior of all types (fads, fashions, crazes, panics, etc.); the organization of all of these in social movements.
- 436. **Contemporary Sociological Theories (3:3:0).** Prerequisite: 9 semester hours of sociology, including SOC 230, or consent of instructor.
- 437. **Social Change (3:3:0).** Prerequisite: SOC 230 or consent of instructor.
- 438. **Population Problems (3:3:0).** Prerequisite: SOC 230 or consent of instructor.
- 439. **Methods of Sociological Research (3:3:0).** Prerequisite: SOC 230 or consent of instructor. An introduction to methods of data collection and analysis; the interpretation of social data.
- 4311. **The Sociology of the Person (3:3:0).** Prerequisite: SOC 230 or consent of instructor. Effects of group membership on individual behavior; emphasis on childhood and adolescent experiences in primary groups.
- 4312. **The Urban Community (3:3:0).** Prerequisite: SOC 230 or consent of instructor. The community in its ecological, cultural, and social aspects.
- 4313. **American Minority Problems (3:3:0).** Prerequisite: SOC 230 or consent of instructor.
- 4314. **Social Stratification (3:3:0).** Prerequisite: SOC 230 or consent of instructor. Economic, political, and prestige structures in modern societies. Interrelationships of class, power, and status levels studied to determine their influence on social institutions and personality structure.

4315. **Sociology of Religion (3:3:0)**. Prerequisite: SOC 230 or consent of instructor. The sociological study of religious groups and religious systems. The social origin and the social consequences of religious beliefs. The patterns of social interaction in religious groups and their consequences for the participants. The reciprocal relationships between religious institutions and groups in the society.
4316. **Development of Sociological Theory (3:3:0)**. Prerequisite: SOC 230 and 6 hours of advanced sociology. The emergence of systematic sociological theory out of the social philosophy of the past. The evolution of sociology as a discipline in the late nineteenth and early twentieth centuries.

FOR GRADUATES

531. **Sociological Theory (3:3:0)**. Prerequisite: Consent of department chairman. Individual study. May be repeated once for credit.
532. **Seminar in the Person and Society (3:3:0)**. Prerequisite: 12 hours of sociology or consent of instructor. Examination of symbolic interactionist theory, the process of socialization, and selected problems related to the effects of the social structure on a given person during various periods of his span.
533. **Seminar in Contemporary Sociological Theory (3:3:0)**. Prerequisite: 9 hours of advanced credit in sociology, including SOC 436, or consent of instructor.
534. **Seminar in Sociological Research Methods (3:3:0)**. Prerequisite: 9 hours of advanced credit in sociology, including SOC 439, or consent of instructor.
535. **Seminar in Social Disorganization (3:3:0)**. Prerequisite: SOC 230, 233, and 6 hours of advanced sociology, or consent of instructor.
536. **Seminar in Sociological Uses of Historical Data (3:3:0)**. Prerequisite: 6 hours of sociology and 6 hours of history, or consent of instructor. Analysis and use of documents, records, and other historical materials as they may be interpreted sociologically.
537. **Seminar in Demography (3:3:0)**. Prerequisite: 12 hours of sociology, including SOC 438, or consent of instructor.
5335. **Society and Its Institutions (3:3:0)**. Prerequisite: Two or more years of teaching experience in the public schools, and consent of instructor. Study of society as a network of institutions, stressing the interdependence of institutions, with special reference to problems created in the contemporary American society by changes in some of the basic institutions.
631. **Master's Thesis (3)**. Enrollment required at least twice.

Courses in Anthropology.

FOR UNDERGRADUATES

231. **The Origin and Nature of Man (3:3:0)**.
232. **Cultural Anthropology (3:3:0)**.
332. **Physical Anthropology (3:3:0)**.
3311. **Major Cultural Developments of the Old World (3:3:0)**.

FOR UNDERGRADUATES AND GRADUATES

430. **Cultures and Peoples of the Southwest (3:3:0)**.
431. **Field Archaeology (3:3:0)**.
432. **Man and the Supernatural (3:3:0)**. Prerequisite: ANTH 232 or consent of instructor.
438. **Culture and Personality (3:3:0)**.
439. **Peoples and Cultures of Oceania (3:3:0)**.
460. **Introduction to Field Research in Prehistory (6)**. Prerequisite: ANTH 461 or consent of instructor. A field course.
461. **Archaeology of Mexico (6)**. A field course.
4311. **Anthropological Linguistics (3:3:0)**.
4313. **Peoples of North America (3:3:0)**. Prerequisite: Consent of instructor.
4314. **Prehistory of Meso and South America (3:3:0)**. Prerequisite: Consent of instructor.
4315. **Prehistory of North America (3:3:0)**. Prerequisite: ANTH 231 or consent of instructor.
4316. **Peoples of Meso and South America (3:3:0)**. Prerequisite: Consent of instructor.
4321. **Individual Problems in Anthropology (3:3:0)**. Prerequisite: ANTH 231 and 232 or consent of instructor. Individual studies. May be repeated once for credit.
4322. **Peoples of Africa (3:3:0)**. Prerequisite: Consent of instructor. An ethnographic survey of the peoples and culture areas south of the Sahara.

FOR GRADUATES

531. **Anthropological Theory (3:3:0)**. Prerequisite: 9 hours of anthropology or consent of instructor. Individual studies. May be repeated once for credit.
5335. **Origins of Social Customs and Institutions (3:3:0)**.

Department of Speech

This department supervises the following degree programs: *SPEECH, Bachelor of Arts, Master of Arts.*

In addition to the general requirements of the School of Arts and Sciences for the Bachelor of Arts degree, the following are requirements for the major in speech. All courses in the general speech area listed below are required. A minimum of 3 semester hours is required in each of four of the six numbered groups listed below. A choice may also be made between 4351—History of Speech, and 3311—History of Theater, one of which is required. Not more than 6 semester hours of Practicum in Repertory Theater may be counted toward the major or minor. Additional hours may be elected to make the total from 36 to 42 semester hours of speech.

GENERAL SPEECH

131. **Fundamentals of Speech**
(or equivalent)
133. **Voice and Diction**

I. ORAL INTERPRETATION

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|-------------------------------------|--------------------------------|
| 237. Oral Interpretation | 432. Senior Projects in Speech |
| 316. Oral Interpretation Activities | 435. Interpretative Reading |

II. PUBLIC ADDRESS

- | | |
|--|--------------------------------|
| 235. Discussion and Debate | 430. Advanced Public Speaking |
| 311. Parliamentary Procedure | 432. Senior Projects in Speech |
| 318. Forensic Activities | 437. Persuasion |
| 339. Oral Communication in Group Processes | 4351. History of Speech |

III. RADIO-TELEVISION

- | | |
|--|---|
| 238. Introduction to Radio and Television Broadcasting | 337. Television Program Production |
| 317. Radio-Television Activities | 432. Senior Projects in Speech |
| 335. Fundamentals of Radio and Television Broadcasting | 436. Radio and Television Program Planning and Management |
| 336. Radio Program Production | 4331. Television Program Direction |

IV. SPEECH CORRECTION

- | | |
|---------------------------------------|--|
| 236. Speech Science and Phonetics | 4319. Speech Correction Methods |
| 331. Speech Anatomy and Physiology | 4321, 4322. Supervised Clinical Practice in Speech Correction |
| 432. Senior Projects in Speech | 4323, 4324. Supervised Clinical Practice in Audiology and Aural Rehabilitation |
| 433. Introduction to Hearing Problems | |
| 434. Principles of Audiometry | |
| 4318. Speech Pathology | |

V. SPEECH EDUCATION

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|---|--|
| 432. Senior Projects in Speech | 4325. Directing School Speech Activities |
| 439. Methods in Teaching Speech and Theater | |

VI. THEATER

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|---|--|
| 211. Stage Makeup | 3313. Principles of Theatrical Lighting |
| 231. Introduction to the Theater and Cinema | 3314. Principles of Theatrical Costuming |
| 232. Principles of Acting | 3315. Practicum in Repertory Theater I |
| 319. Theater Activities | 3316. Practicum in Repertory Theater II |
| 332. Advanced Acting | 431. Creative Dramatics |
| 3311. History of Theater | 432. Senior Projects in Speech |
| 3312. Principles of Theatrical Scenery | 4311. Stage Directing Methods |
| | 4312. Theory and Practice of Playwriting |

Teacher Education. In the teacher certification program, speech and/or drama may be used as a teaching field at the secondary level and as an area of specialization at the elementary level. It also is a separate area in the all-level certificate program and in the teaching exceptional children certificate program.

Students seeking a provisional certificate with speech and/or drama as a teaching field should consult the Chairman of the Department of Speech.

Courses in Speech.**FOR UNDERGRADUATES**

131. Fundamentals of Speech (3:3:0).
133. Voice and Diction (3:3:0).
211. Stage Makeup (1:0:3).
231. Introduction to the Theater and Cinema (3:3:0). A study of the modern theater and cinema as art forms, with attention to the historical background and traditions of each. Emphasis is placed on a better understanding of the social, cultural, and aesthetic significance of theater and cinema. Attendance, when it can be arranged, at representative plays and motion pictures.
232. Principles of Acting (3:2:3). Study and application of the theories and techniques of the art of acting.
235. Discussion and Debate (3:3:0). Study of and practice in the essential tools of a democratic society; group problem-solving and methods of inquiry and advocacy.
236. Speech Science and Phonetics (3:3:0). A study of the way voice is produced and speech formed. Also included is a study of the instrumentation employed in the measurement of voice and speech and the phonetic alphabet employed to transcribe speech sounds to the printed page.
237. Oral Interpretation (3:3:0). Major emphasis is placed on the appreciation of good literature and its effective oral interpretation from the printed page.
238. Introduction to Radio and Television Broadcasting (3:3:0). A survey course in the origin, history, and development of radio and television. Not for students concentrating in radio-television.
239. Speech Development for Personal Competence (3:3:0). The course deals with principles and practice of speech skills necessary for personal effectiveness. Primarily for education majors.
311. Parliamentary Procedure (1:1:0). Principles and procedure governing deliberative groups, with practice in their usage.
316. Oral Interpretation Activities (1:0:3). Opportunity for the student participating extensively in oral interpretation activities to secure credit for this laboratory work. Limit: 4 semester hours for speech majors and minors, 2 semester hours for others.
317. Radio-Television Activities (1:0:3). Opportunity is offered the student who wishes to participate extensively in radio-television activities to secure credit for this laboratory work. Limit: 4 semester hours for speech majors and minors, 2 semester hours for others.

318. **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. Limit: 4 semester hours for speech majors and minors, 2 semester hours for others.
319. **Theater Activities (1:0:3).** Opportunity is offered the student who wishes to participate extensively in theater activities to secure credit for this laboratory work. Limit: 4 semester hours for speech majors and minors, 2 semester hours for others.
331. **Speech Anatomy and Physiology (3:3:0).** Study of the functioning of the speech mechanism and voice basic to major study in speech.
332. **Advanced Acting (3:2:3).** Prerequisite: SPCH 232. Continuation of the study and application of the theories and techniques of the art of acting, with emphasis upon characterization, analysis of roles, and techniques and types of performance.
335. **Fundamentals of Radio and Television Broadcasting (3:3:0).** The basic principles and techniques for the operation of a radio or television control room, performance on radio and television. For students concentrating in radio and television.
336. **Radio Program Production. (3:2:3).** Prerequisite: SPCH 335, or approval of instructor. A concentrated and practical course covering the multiple problems faced by the radio station manager. Opportunity to acquire professional facility and techniques in direction and production of radio programs on the campus station KTXT-FM.
337. **Television Program Production (3:2:3).** Prerequisite: SPCH 335, or approval of instructor. A concentrated and practical course on the theory and application of the principles of television production.
338. **Business and Professional Speech (3:3:0).** Prerequisite: Sophomore classification. Basic principles of speech applied to the speech needs of the professional man and woman. Practice in the construction and delivery of the various types of speeches and participation in group conferences, discussions, and interviews. For majors in other fields than speech.
339. **Oral Communication in Group Processes. (3:3:0).** A study of group behavior, participation, structure, and leadership, and their evaluation with particular attention to oral communication.
3311. **History of Theater (3:3:0).** Prerequisite: SPCH 231 or consent of instructor. A study of the origin and history of the theater as a social and aesthetic force.
3312. **Principles of Theatrical Scenery (3:2:3).** Prerequisite: SPCH 231 or equivalent. The study of technical problems of play production. Design, construction, and painting of scenery and properties; and special effects.
3313. **Principles of Theatrical Lighting (3:2:3).** Prerequisite: SPCH 231 or equivalent. Study of the theory and practice of theatrical stage lighting. Elementary electricity, lighting control and instruments, lighting design.
3314. **Principles of Theatrical Costuming (3:2:3).** Prerequisite: SPCH 231 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.
3315. **Practicum in Repertory Theater I (3:0:9).** Prerequisite: SPCH 133, 231, 232, or equivalent. Practical work in the organization, mounting, and presentation of plays in a repertory situation. May be repeated for credit.
3316. **Practicum in Repertory Theater II (3:0:9).** Prerequisite: SPCH 133, 231, 232, or equivalent. Practical work in the organization, mounting, and presentation of plays in repertory situations. May be repeated for credit.
432. **Senior Projects in Speech (3).** Prerequisite: Senior classification and 9 hours in the area in which the project is to be pursued. 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. Students required, in advance of registration, to consult with the instructor and secure the department chairman's approval of the specific project to be pursued. May be repeated only once for credit.

FOR UNDERGRADUATES AND GRADUATES

430. **Advanced Public Speaking (3:3:0).** Prerequisite: 9 hours of speech, including 3 hours primarily in public speaking.
431. **Creative Dramatics (3:3:0).** Studies in the principles and methods of developing original dramatizations with children.
433. **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.
434. **Principles of Audiometry (3:3:0).** Principles of testing hearing loss through use of various types of audiometers. Use and interpretation of audiograms. The physics of sound as related to hearing. Psychological problems of hearing. Clinical observation and practice.
435. **Interpretative Reading (3:3:0).** Prerequisite: Junior classification and 12 hours of English. Students are advised to complete SPCH 133 and/or 237 before taking this course.
436. **Radio and Television Program Planning and Management (3:3:0).** Prerequisite: SPCH 336 or 337, or approval of instructor. Objectives and methods in planning commercial and educational programs for radio and television. Station staff organization and administration emphasized. Case studies and individual projects.
437. **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, radio, and public affairs.
439. **Methods in Teaching Speech and Theater (3:3:0).** Prerequisite: 18 hours of speech and 9 hours of education. Review of the areas of speech. A survey of texts and their critical analysis. Preparation of syllabi.
4311. **Stage Directing Methods (3:2:3).** Prerequisite: Junior classification; SPCH 231, 232, 333, and 334.
4312. **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.
4315. **Speech for the Deaf (3:3:0).** Prerequisite: SPCH 236, 331, 4318, or consent of instructor. This is a methods course concerned with the development of oral speech for the deaf. Emphasis is placed on the use of all sensory modalities (visual, tactual, kinesthetic, and residual hearing) as aids to speech development.
4316. **Language Development for the Deaf (3:3:0).** Prerequisite: SPCH 236, 331, 4318, or consent of instructor. This course is concerned with the language process of the deaf child such as levels of language, acquisition of language, and methods of teaching oral and written language.

4317. **Speech Reading and Auditory Training Methods (3:3:0).** Prerequisite: SPCH 236, 331, and 433, or consent of instructor. This methods course is designed to familiarize prospective teachers of the deaf and hard of hearing with various methods of teaching speech reading and auditory training, and to develop specific teaching abilities in speech reading and auditory training.
4318. **Speech Pathology (3:3:0).** Prerequisite: SPCH 133, 236, 331, or the consent of the instructor. A survey of the speech pathology field with emphasis on etiological factors responsible for speech disorders and description of clinical types.
4319. **Speech Correction Methods (3:3:0).** Prerequisite: Speech 133, 236, 331, 4318, or the consent of the instructor. An introduction to methods of evaluating defective speech and the elementary aspects of therapy to alleviate defective speech.
- 4321, 4322. **Supervised Clinical Practice in Speech Correction (3 each).** Thirty-five laboratory hours per credit hour. Prerequisite: SPCH 4318, concurrent registration in SPCH 4319, or permission of department chairman. Required of students desiring certification as speech therapists.
- 4323, 4324. **Supervised Clinical Practice in Audiology and Aural Rehabilitation (3 each).** Prerequisite: SPCH 433 and 434. Thirty-five laboratory hours per credit hour. Clinical work with deaf and hard-of-hearing cases under supervision. Includes audiology and therapy. Required of students seeking certification as audiologists.
4325. **Directing School Speech Activities (3:2:3).** Prerequisite: 12 hours of speech or education, and/or teaching experience. Methods and principles involved in extracurricular speech activities, such as discussion, debate, dramatics, public speaking, and radio. Students will have an opportunity to work with individuals and projects in different activities.
4326. **Advanced Speech for the Deaf (3:3:0).** Prerequisite: SPCH 236, 331, 4318, and 4315. This is a methods course at an advanced level. The course is concerned with the development of oral speech for the deaf. Emphasis is placed on the use of all sensory modalities, visual, tactual, kinesthetic, and residual hearing as aids to speech development.
4327. **Advanced Language Development for the Deaf (3:3:0).** Prerequisite: SPCH 236, 331, 4318, and 4315. At an advanced level this course deals with the language processes of the deaf child. It is an extension of SPCH 4316.
4331. **Television Program Direction (3:2:3).** The preparation and directing of television programs, including television dramas, variety shows, documentaries, and educational programs, for use in commercial stations.
4351. **History of Speech (3:3:0).** Prerequisite: Junior classification. A study of the origin, history, and development of speech as a social function and force.

FOR GRADUATES

511. **Studies and Problems in Speech (1:1:0).** May be repeated for credit.
521. **Studies and Problems in Speech (2:2:0).** May be repeated for credit.
531. **Studies and Problems in Speech (3:3:0).** May be repeated for credit.
532. **Research Methods in Speech (3:3:0).**
535. **Seminar in Audiology: Psychophysics of Audition (3:3:0).** Prerequisite: An undergraduate major in audiology or speech pathology is required or the consent of the instructor. This course considers the basic correlates of the auditory stimulus, the mechanical properties of the ear, and the psychophysiology of hearing and deafness.
536. **Seminar in Speech Pathology: Articulation and Voice Disorders. (3:3:0).** Prerequisite: An undergraduate major in speech pathology is required or the consent of the instructor. A study at the advanced level of articulation and voice problems. The course considers etiology, diagnosis, and therapy.
538. **Educational Television (3:3:0).** Graduate classification. The history, social impact, and effect that educational broadcasting has had upon the American way of life. Evaluation of in-school and general educational programs; the use of television in the classroom; the presentation of educational material on television.
5311. **Seminar in Speech Pathology: Organic Speech Disorders (3:3:0).** Graduate classification, limited to majors in speech correction and/or audiology who have had SPCH 4318, 4319, and 331 or equivalent. A study of the anatomical malfunction of defects which result in such so-called organic speech disorders as cleft palate, cerebral palsy, and aphasia. Also includes a study of the sociological, psychological, and therapeutic implications of such speech defects.
5312. **Seminar in Speech Pathology: Stuttering (3:3:0).** Graduate classification, limited to speech correction and audiology majors, or other students who have obtained the consent of the instructor. A study of stuttering beyond the scope of introductory presentation. Stuttering theory and therapy studied from the view of learning theorists, psychoanalysts, and other disciplines which profess to treat stuttering.
5313. **Seminar in Audiology: Aural Rehabilitation (3:3:0).** Graduate classification. Open to speech correction and audiology majors, or other students who have completed SPCH 433 and 434 or equivalent. A study of the language, social, and educational problems of the more severely hard-of-hearing or deaf individual and the current methods of dealing with these problems.
5314. **Seminar in Audiology: Clinical Audiology (3:3:0).** Graduate classification. Limited to students who have taken SPCH 433 and 434 or equivalent. This course deals with special types of audiometry, such as aural overload audiometry, electrodermal response (EDR) audiometry, tests for selection of hearing aids, and others.
5315. **Advanced Discussion, Debate, and Conference Methods (3:3:0).** A study of the history and philosophy of discussion and debate and their application to specialized forms, with special emphasis on newer techniques in the business and educational conference, including consideration of group dynamics.
5316. **Dramatic Criticism (3:3:0).** Principles of dramatic criticism from Aristotle to the present day.
5317. **Studies in Modern Theater (3:3:0).** The principal developments in the European and American theater from 1870 to the present day.
5318. **Studies in the Production of Pre-Modern Drama (3:3:0).** A study of the problems of producing classical Elizabethan, French neo-classic, Restoration, and eighteenth-century drama for present-day audiences.
5319. **Theory and Practice of Scene Design (3:2:3).** Theory and practice of designing stage scenery.
5321. **Theater Costume Design (3:2:3).**
5322. **Theory and Practice of Stage Lighting (3:2:3).**

5323. **Classical Rhetoric and Public Address (3:3:0)**. Prerequisite: Advanced Public Speaking and History of Speech.
5324. **British and American Public Address (3:3:0)**. Prerequisite: Graduate standing.
5325. **Contemporary Rhetorical Theory and Practice (3:3:0)**. Prerequisite: 6 semester hours of senior or graduate level courses in public address.
5326. **Graduate Clinical Practice—Speech (3:0:9)**. Prerequisite: An adequate undergraduate background in speech therapy is required which includes 100 hours of undergraduate supervised clinical practice. Supervised clinical practice in diagnostic methodology used in speech pathology. Advanced therapy for difficult and/or complex clinic types. Thirty-five hours of lab required for each semester hour of credit.
5327. **Graduate Clinical Practice—Hearing (3:0:9)**. Prerequisite: An adequate undergraduate background in audiology and aural rehabilitation is required which must include at least 100 hours of undergraduate supervised clinical practice in audiology. This course includes supervised clinical practice in audiology as well as supervision of such procedure as the teaching of lip-reading, auditory training, and speech and language for the deaf and hard-of-hearing. Students registering for this course will be expected to participate in all areas which might be included in the habilitation of aurally handicapped children and the rehabilitation of aurally handicapped adults.
5328. **Seminar: Oral Communications in Group Processes (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. A study in depth of the theories, experiments, and research dealing with the oral communication in group processes.
5329. **Advanced Practicum in Repertory Theater I (3:0:9)**. Prerequisite: An undergraduate major in theater arts, or consent of instructor. Practical work in supervision of the organization, mounting, and presentation of plays in a repertory situation. May be repeated for credit.
5330. **Advanced Practicum in Repertory Theater II (3:0:9)**. Prerequisite: An undergraduate major in theater arts, or consent of instructor. Practical work in supervision of the organization, mounting, and presentation of plays in a repertory situation. May be repeated for credit.
5331. **Seminar in Theater History (3:3:0)**. Prerequisite: An undergraduate major in theater arts or consent of the instructor. Consideration of the theater of a specific historical epoch, or the comparative study of the theater of several periods. May be repeated for credit.
5335. **Basic Speech for Elementary Teachers (3:3:0)**. A study of the basic characteristics of speech skills and abilities necessary for effective speech, and the use of speech in classroom activities.
5341. **Seminar in Speech Pathology: Language Problems in Children (3:3:0)**. Prerequisite: An undergraduate major in speech pathology is required or the consent of the instructor. This course considers the nature of language disorders in children, the etiological factors responsible for language disorders in children, and the therapeutic processes involved in the treatment of language disorders in children.
5342. **Seminar in Speech Pathology: Language Problems in Adults (3:3:0)**. Prerequisite: An undergraduate major in speech pathology is required or the consent of the instructor. This course considers the nature of language disorders in adults, the etiological factors responsible for language disorders in adults, and the therapeutic processes involved in the treatment of language disorders in adults.
630. **Master's Report (3)**.
631. **Master's Thesis (3)**. Enrollment required at least twice.

Reserve Officers Training Corps

The departments of the Army and the Air Force both maintain senior division Reserve Officer Training Corps units under the administration of the School of Arts and Sciences for the purpose of developing and producing officers, and outstanding ROTC graduates may be recommended for commissions.

In addition to the four-year ROTC commissioning program, a two-year program is now available to afford junior college transfers an opportunity to obtain Army or Air Force commissions under certain provisions.

All physically fit male freshmen and sophomore students, except veterans, are required to elect either band, physical education, military science, or aerospace studies.

Four-Year Program. The four-year program is composed of two years of basic course studies and two years of advanced course studies, including a six-week summer training encampment at an Army post or four weeks at an Air Force base.

Basic Course. To enroll in the four-year ROTC program the student must be physically qualified as prescribed by the Department of the Army or Air Force, be accepted by the institution as a regularly enrolled student, be not less than 14 years of age at the time of enrollment, and agree to complete the basic course once enrolled, unless released by mutual agreement between the student's academic dean and the Professor of Military Science or Professor of Aerospace Studies. Upon completion of one semester of the ROTC program, and if the student desires, he may be deferred from selective service for as long as he remains in the program, although his obligation to register with his local draft board remains unchanged. Midyear enrollees are accepted in the ROTC programs (veterans and students who have had previous ROTC training may receive credit, based on length of service or training for all or part of the basic course; credit for high school ROTC may

be granted for one year of the Army or Air Force basic course). Upon completion of the basic course, a student may continue in the advanced course ROTC if he so desires, provided he meets the requirements listed in the following paragraph.

Advanced Course. To be able to enroll in the advanced ROTC program a student must have successfully completed the basic course, be a citizen of the United States, be not less than 17 years old, and be able to complete all requirements for appointment as regular or reserve officer by the time he is 28 years old (for the Air Force, by the time he is 26 years and six months old, if he is programmed for flying training, or 28 years old, if he is programmed for other than flying training). He must also successfully complete such general survey or screening tests as are required, be physically qualified as prescribed by the Department of the Army or Air Force, be a regularly enrolled student, and be selected by the Professor of Military Science or Professor of Aerospace Studies to continue in the program. Upon admission to the advanced course program, the student must agree in writing, with the consent of his parent or guardian if he is a minor, to complete the advanced course of instruction and accept a commission as a second lieutenant. This agreement is automatically terminated when the student receives his commission or is disenrolled from the ROTC for any reason other than willful evasion of his contract.

All advanced course students are automatically deferred from the draft.

Summer Camp. Members of advanced ROTC are required to attend one summer camp, normally between their junior and senior years. Army ROTC summer camp begins early in June each year and lasts six weeks. Air Force ROTC has two four-week summer camps. The first camp begins early in June and the second early in August. Advanced four-year ROTC program students are required to attend only one summer camp.

Commissioning. Upon receiving a commission, the ROTC student agrees to serve as follows:

ARMY: Six months or two years on active duty. The length of active duty depends upon desires of the individual and the needs of the Army at the time of commissioning.

AIR FORCE: Four years on active duty in a nonflying capacity, or six years on active duty if given flight training.

Two-Year Program. The two-year program is designed specifically to fill the needs of junior college graduates and students of four-year colleges who have not taken ROTC during the first two years.

Entry requirements into the two-year program will be the same as entry into the four-year advanced program except for two additional requirements. These two requirements are the completion of a six-week basic training camp conducted during the summer prior to enrollment and acceptance for enrollment in Texas Technological College by the Dean of Admissions.

Summer Camp. Both Army and Air Force ROTC students must attend preenrollment summer camps before enrolling in a two-year program. The Air Force ROTC student can choose to go to the first preenrollment camp, which begins in early June, or the second camp, which begins about the middle of July. The Army ROTC camp begins in early June. In addition, the Army ROTC student must attend the summer camp between the two years of his program. (The Army regular summer camp is the same as the one available to the four-year program advanced Army ROTC students.) The Air Force does not have the requirement for the two-year program student to attend a summer camp other than the preenrollment summer camp mentioned above. Military training at all ROTC camps will consist of practical and theoretical instruction.

Financial Assistance. When the student enters the advanced course, he becomes eligible to receive cadet retainer pay of not less than \$40 and not more than \$50 per month beginning on the day he starts advanced training and ending upon completion of his instruction, but in no event shall any student receive such pay for more than 20 months.

Scholarships. The Financial Assistance Grants are awarded to four-year Air Force cadets (at the beginning of their junior year) who possess outstanding academic records, who attain satisfactory scores on the Air Force Officer Qualifying Tests, and who demonstrate qualities of officer potential

(leadership ability, initiative, and dependability). The Financial Assistance Grant provides the selected Air Force cadet with \$50 per month in addition to payment of all fees (including lab fees) and up to \$150 for books over a two-year period.

Two types of scholarships are available from the Department of the Army. Four-year scholarships are awarded on a competitive basis by each of the five continental U.S. Armies—and two-year scholarships are awarded to outstanding Military Science II cadets selected by the Professor of Military Science and a board of Army and College officials. Both scholarships pay all tuition and regular classroom expense, such as fees, textbooks, etc., as well as \$50 per month for subsistence.

Uniforms and Equipment. Each ROTC student is furnished an officer-type uniform, including overcoat or raincoat and shoes, without cost to the student. Each student is required to maintain his uniform by cleaning and proper care and to return it to the ROTC military property custodian in the event he leaves school or becomes separated from the ROTC for other reasons. This uniform and other equipment remains the property of the federal government or the College. All advanced ROTC students who receive a commission will also receive a \$300 uniform allowance when they are called to active duty.

The federal government provides the necessary texts and equipment to carry out the ROTC program at no cost to the student.

Flight Training. During their final year in Army and Air Force ROTC, selected advanced course students may receive flight training in a standardized flight instruction program approved by the Federal Aviation Agency. The course consists of 35 hours of ground instruction and 36½ hours of flight instruction, both given on an extracurricular basis. No academic credit is received, but students completing the course are given the opportunity to qualify for a Federal Aviation Agency private pilot's certificate.

Note: For Air Force ROTC a minimum of 5 hours of ground school instruction will be given.

Aerospace Studies

(Air Force ROTC)

The educational curriculum of the Air Force ROTC is designed to develop skills and attitudes vital to the career professional Air Force officer and to qualify for commissions those college men who desire to serve in the United States Air Force.

The purposes and specific objectives of the Air Force ROTC program are

- a. To select and motivate cadets to serve as career Air Force officers in fields as specifically required by the United States Air Force.

- b. To develop in cadets by precept, example, and participation the attributes of character, personality, and attitudes essential for leadership.

- c. To develop in cadets an interest in, and understanding of, the Air Force mission, organization, operations, problems, and techniques.

- d. To provide that military education and training which will give cadets a general background and sound foundation on which to build an officer career.

All courses are taught by Air Force officers on active duty who are assigned to the College as faculty members.

General Military Course Program. Entrance to the General Military Course will be granted *only* to those who have completed the necessary screening test and meet physical requirements.

The General Military Course includes causes of the present world conflict, a comparison of democracy, fascism, and communism, organization of Air Force commands, and a study of world military issues surrounding the existence of these forces.

In the fall and spring semester of his freshman year, the student will have one hour of Leadership Laboratory a week. In the fall and spring semester of his sophomore year, the student includes in his schedule two hours in the classroom and one hour of Leadership Laboratory a week.

Professional Officer Course Program. The advanced program is titled Professional Officer Course Program and introduces the student to the growth and development of aerospace power, military professionalism, and leader-

ship and management responsibilities of the professional officer. In both semesters of his junior and senior year, the student takes 3 hours in the classroom. Drill and staff work within the cadet corps is a required supplement. The student in the four-year program is also required to attend a four-week summer camp at an Air Force base. This is normally accomplished between the junior and senior years, but under exceptional circumstances it may be delayed until completion of the senior year. The student in the two-year program attends only the six-week preenrollment summer camp.

Entrance to the Professional Officers Course is limited to those who are regularly enrolled in the College, have completed the necessary screening, testing, and physical examination, and have completed the General Military Course or the preenrollment six-week basic summer camp, or receive credit for prior service. (Students who have had honorable active service in the Army, Navy, Marine Corps, Air Force, or Coast Guard may request a waiver of the General Military Course as a requirement for entrance into the advanced course.)

Students who complete the Professional Officers Course are tendered commissions as second lieutenants in the United States Air Force Reserve. Commissions in the Regular Air Force are offered each year to those cadets who complete the Professional Officers Course with outstanding records.

Awards and Recognition.

Professor of Aerospace Studies Leadership Award. Awarded to a senior cadet demonstrating outstanding leadership within the Corps.

The President's Award. Awarded to an outstanding senior cadet, based on academic standing and demonstrated ability as evidenced by his contributions to cadet activities and student life during his college career. This award is presented by the President of the College.

Pilot Training Badge. Wings are awarded each spring to advanced cadets who have successfully completed the Flight Training Program.

Distinguished Military Students. Students possessing outstanding qualities of leadership, high moral character, and definite aptitude for military service, whose academic standing is in the upper half of their college class and the upper third of ROTC, are considered for designation as Distinguished Military Students. Official designation and award of the DMS badge is made early in the senior year.

Distinguished Military Graduates. Distinguished Military Students who maintain their high standards of performance until graduation are designated Distinguished Military Graduates and are eligible to apply for Regular Air Force commissions.

Angel Flight. The Angel Flight is an organization of college women sponsored by the Arnold Air Society of the Air Force ROTC. Its mission is to promote interest in the Air Force ROTC program. A noted feature of the Angel Flight is its precision drill team. Selection for membership in the Angel Flight is based on marching ability, beauty, charm, poise, personality, and scholastic standing.

Curriculum in Air Force Aerospace Studies.

FIRST YEAR

111. **Aerospace Leadership Laboratory (1:0:1).** Prerequisite: Pass the A.F. preenrollment test. Introduction to leadership principles and techniques through participation and study of the basic elements of military discipline.
112. **Aerospace Leadership Laboratory (1:0:1).** Prerequisite: Pass the A.F. preenrollment test. Introduction to leadership principles and techniques through participation and study of the basic elements of military discipline.

SECOND YEAR

211. **Leadership Laboratory (1:0:1).** Prerequisite: AERS 111 and 112. Intermediate principles and practices of leadership involved in controlling units and an introduction of supervisory problems of the leaders.
212. **Leadership Laboratory (1:0:1).** Prerequisite: AERS 111 and 112. Intermediate principles and practices of leadership involved in controlling units and an introduction of supervisory problems of the leaders.
223. **World Military Systems (2:2:0).** Prerequisite: AERS 111 and 112. An introductory course explaining the causes of the present world conflict, the role and relationship of military power to that conflict, and the responsibility of an Air Force officer.
224. **World Military Systems (2:2:0).** Prerequisite: AERS 111 and 112. A comparative study of world military forces to include free world land and naval forces, free world air forces, communist military systems, and trends in the development and employment of military power.

THIRD YEAR

335. **Growth and Development of Aerospace Power (3:3:0).** Prerequisite: Junior standing. A course concerning the nature of war, development of air power in the United States, mission and organization of the Defense Department, Air Force concepts, doctrine and employment.
336. **Growth and Development of Aerospace Power (3:3:0).** Prerequisite: Junior standing. Astro-nautics and space operations, and the future development of aerospace power. Includes the United States space programs, vehicles, systems, and problems in space exploration.

FOURTH YEAR

433. **The Professional Officer (3:3:0).** Prerequisite: AERS 335 and 336. A study in the meaning of professionalism, responsibilities of the professional officer, foundations of the military profession, and the military justice system.
434. **The Professional Officer (3:3:0).** Prerequisite: AERS 335 and 336. A study of leadership theory, functions, and practices, management principles and functions, problem and solving, and management tools, practices, and controls.

Military Science (Army ROTC)

The Army ROTC program consists of two parts:

Basic Course. A two-year course consisting of 1 hour of classroom instruction and 1½ hours of drill per week during the freshman year, and 2 hours of classroom instruction and 1½ hours of drill per week during one semester of the sophomore year. During the other semester, and in addition to 1½ hours of drill per week, a college-related course, History of Military Affairs (HIST 3317), is substituted for one semester of military science academics.

Advanced Course. Consists of 3 hours of classroom instruction and 1½ hours of drill per week during the first semester of the junior and senior years, and 2 hours of classroom instruction and 1½ hours of drill per week during the second semester of the junior and senior years. In addition to the classroom instruction and drill, each advanced course student will attend one six-week summer camp.

Upon graduation the student who has successfully completed the advanced course may be tendered a commission as a second lieutenant in the United States Army Reserve. Outstanding military science students who are selected as Distinguished Military Graduates may be offered commissions as second lieutenants in the Regular Army.

Army ROTC Military Science Curriculum. The Military Science curriculum is designed to prepare students for commissions as officers in the various arms and services of the United States Army, both regular and reserve. There is no specialization during the ROTC course; all students pursue the same subjects. The student receives specialized training in the techniques and duties of the various branches at the branch schools when ordered to active duty after graduation and commissioning.

The basic purpose of Army ROTC is to develop a cadets' qualities of leadership. This principle lies behind every hour of ROTC training. Specifically the training gives the cadet:

1. An understanding of human behavior, together with proven methods for motivating others.
2. Indoctrination in the techniques of leadership—tested practices and devices which tend to make him an effective leader.
3. Opportunity to apply the principles of leadership to everyday problems.

Awards and Recognition. The various individual awards presented by the Department of Military Science during the school year are the President's Award, Gerald Brown Memorial Award, Distinguished Military Student Badge, Superior Cadet Award, Military Excellence Ribbon, Good Conduct Award, Academic Achievement Ribbon, and Student Pilots Badge. In addition, Army cadets are eligible for the following awards presented by outside agencies: the Army and Navy Legion of Valor of the United States of America, National Defense Transportation Association Medal, Texas Sons of the American Revolution Award, National Defense Supply Association Award, Dr. Ralph Mushon Memorial Award, American Legion Marksmanship Award, American Ordnance Association Award, Association of the United States Army Award, Armed Forces Communication and Electronics Award, and the Reserve Officers Association Medal.

Army CorpsDettes. The Army CorpsDettes is an organization of college women who have qualified for membership by personal appearance and charm, motivation, and scholastic achievement. This auxiliary to the Corps of Cadets has four main objectives: 1. To stimulate interest in the Army Reserve Officers Training Corps; 2. To augment the educational experiences of CorpsDettes members; 3. To participate in extracurricular activities which contribute to the welfare of Texas Technological College and of the Army ROTC Cadet Corps; 4. To act as an auxiliary drill team to the Cadet Corps.

Drum and Bugle Corps. The Army ROTC maintains a drum and bugle corps as an integral part of the Cadet Brigade. Students with prior band experience may be assigned to the drum and bugle corps and will practice and play during the normal drill period. Instruments are furnished by the federal government; however, students owning instruments are encouraged to use them.

Curriculum in Army Military Science.

FIRST YEAR

111. **Organization of the Army and Individual Weapons Training (1:1:1).** Prerequisite: Physical, mental, and moral qualifications as prescribed by the Department of the Army. Organization of the Army and ROTC; small arms characteristics, functioning, and employment; marksmanship training on the rifle range.
112. **The United States Army and National Security (1:1:1).** Prerequisite: Same as for MILS 111. National defense policy; missions, capabilities, and role of the Army in conceivable types of warfare.

SECOND YEAR

211. **Leadership Laboratory (1:0:1½).** Prerequisite: MILS 111, 112 or equivalent. School of the soldier and exercise of command.
222. **Map and Aerial Photography and Introduction to Operations and Basic Tactics. (2:2:1).** Prerequisite: MILS 111, 112, or equivalent. Reading and employment of maps and aerial photographs; principles of offensive and defensive combat.
- HIST 3317. **History of Military Affairs (3:3:0).** Prerequisite: MILS 111, 112 or equivalent.

THIRD YEAR

331. **Leadership, Military Teaching, and Branches of the Army (3:3:1).** Prerequisite: MILS 211, 222, HIST 3317 or equivalent. Basic psychology of leadership and its application; methods and techniques of military instruction and familiarization with the missions and organizations of the various combat technical branches of the U.S. Army.
322. **Small Unit Tactics and Communications (2:2:1).** Prerequisite: Same as for MILS 331. Principles of offensive and defensive combat operations and their application to the units of the Infantry division battalion; principles of communications and communications systems used in the battalion to include use of radio equipment, wire equipment and field messages.

FOURTH YEAR

431. **Military Operations, Logistics, and Administration (3:3:1).** Prerequisite: MILS 322, 331. Military staff organization and function; principles and uses of military intelligence; mission of supply, supply doctrine, and classes of supply; the Army system of motor transportation and preventive maintenance; fundamentals of Army administration.
422. **Military Law, Role of the United States in World Affairs, and Service Orientation (2:2:1).** Prerequisite: Same as for MILS 431. Fundamental concepts of military justice in the armed forces; basic principles and methods of procedures for pretrial investigations, conduct of trials, and the principles of nonjudicial punishment; analysis of the United States as to its economic power, war potential, and its aptitude for conduct of war; effect of U.S. power and policy on the present world situation; orientation on service life for future officers.

School of Business Administration

The School of Business Administration, organized in 1942, offers work leading to the degrees of Bachelor of Business Administration and Bachelor of Science. The school has a normal enrollment of over 4,000 undergraduate and 250 graduate students. In addition, it makes its courses available to students in other schools of the College in order that they may include business administration subjects in their programs.

The School of Business Administration holds full membership in the American Association of Collegiate Schools of Business and is also a member of the National Association of Business Teacher Education.

The objectives of the School of Business Administration may be classified under three headings—education, research, and service. The primary role of the School of Business Administration is to prepare the individual student at the undergraduate and at the graduate levels for personally rewarding and socially useful careers in business and related types of activity. The final product of the school, the graduate, needs the capacity to understand the environment in which he operates as well as the ability to adjust to the changes that are continually occurring. It is believed that this may be accomplished through study in general education, business fundamentals, and the advanced courses of the professional preparation through the master's level.

The faculty of the School of Business Administration recognizes, as a second objective, the importance of encouraging research to further the development of business and industry in West Texas, the Southwest, and the United States. Not only may this expand the frontiers of knowledge, but it adds also to the preparation and the quality of the faculty. In addition, a research climate fosters in the student an appreciation for research and what might be termed a "research attitude."

Service to the public is the third objective of the school. The faculty assumes a responsibility to disseminate the knowledge it has acquired. At times faculty members may be in a position to provide professional aid in the solution of specific problems.

The School of Business Administration is divided into six instructional departments which offer course work and supervise the degree programs. The student should note carefully any particular requirements indicated by a department in which he plans to major. Specific curricula have been designed for each program, which are presented in groups. Group I (nonprofessional courses) and Group II (basic professional courses) are common to all programs and are given below in the section entitled General Curricula Requirements. Groups III, IV, and in some cases V, appear under the appropriate departmental heading, except for the interdepartmental programs of prelaw, public administration, and general business which appear in this section.

The courses taught in the School of Business Administration are listed on the following pages under the name of the department offering them.

Opportunities for Women. Opportunities for business-trained women are continually expanding and becoming more attractive in government, education, and business. In recent years women who have graduated with majors in accounting generally have found ready employment. Merchandising has long provided major opportunities for women, with more and more of them moving into managerial levels. Women also are being employed increasingly in credit management positions and personnel work. And almost every advertising agency and advertising department has one or more women in responsible and creative positions. However, probably the largest number of

opportunities still lies in the field of business education and secretarial administration. There is indeed an opportunity for a woman in any field for which she prepares, and it increases rapidly as her strength of purpose and adequacy of preparation strengthen.

Load. The normal study load for regular students in the school is 15 or 16 semester hours each semester. The student who shows promise of compiling only a mediocre grade record may have further load restrictions imposed. No student is permitted to enroll for a program of more than 17 semester hours (exclusive of required freshman or sophomore physical education) without special approval from the dean; the student desiring approval of an irregular load should address a written request to the dean *prior* to the registration period, incorporating all pertinent information. 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.

Academic Counseling. During his freshman year the beginning business administration student is counseled on academic matters by the freshman adviser. At the time the student has accumulated 24 semester hours, responsibility for counseling is transferred to the adviser of the student's specialization.

Selection of a Major. It is recommended that the student not attempt to make final selection of his major until he has completed some college work and has had an opportunity to investigate the study programs which are available to him. The required freshman course, Professional Careers in Business (MGT 110), should prove to be of considerable help to the student in making his decision. The student should counsel with the advisers in those fields which he believes to be of possible interest to him. Aptitude tests are available to give students additional help in deciding upon their majors.

Upon the accumulation of 24 semester hours, each student must have selected, and have had approved by a major adviser from that particular field, a major field of study from one of the programs outlined below. The student should notify the freshman adviser of his choice. A student may decide to change to another major at a later time.

Since some courses are offered only in alternate years, there is no reasonable assurance that a student will be able to schedule all of his required courses before an expected graduation date, unless he makes his final major selection and plans his program of courses a full two years in advance.

Length of Degree Programs. Many of the major programs can be completed within normal load limits in eight semesters. Because of their greater semester-hour requirements, some of the majors necessitate a ninth semester or the attendance in one summer session. A student in any major program may be required to attend more than the normal eight semesters because of poor schedule-planning or failure of one or more courses, or for other reasons. Before the close of his junior year each student should plan carefully the scheduling of his remaining degree requirements to determine his proper graduation date and should file an application for the degree in the office of the Dean of Business Administration.

Graduate Study. The School of Business Administration offers study leading to the degree of Doctor of Business Administration.

The school also offers programs with majors in each of its departments leading to the degree of Master of Business Administration, in the Department of Accounting leading to the Master of Science in Accounting, in the Department of Economics leading to the Master of Arts, and in the Department of Business Education and Secretarial Administration leading to the Master of Education.

The professional M.B.A. degree program is offered especially for candidates with backgrounds in engineering, agriculture, the arts, sciences, law, or other nonbusiness areas as well as to business undergraduates. A 56-hour program sweeps the range of introductory and advanced study areas to give the student a broad preparation for successful professional career activity as entrepreneurs or executives in business and industry. The 56 hours may be reduced by any equivalent business study already completed to a minimum of 31 hours.

Details of the graduate programs of the School of Business Administration will be found in the *Catalog of the Graduate School*.

Honors Studies. The Honors Plan of the School of Business Administration is designed to present special instruction, counseling, and recognition to superior students in order that they may better realize and develop their capabilities through stimulating, intensive, and enriched study. Qualified students are admitted to the program at the beginning of their freshman year. Admission is based upon the scores of the Scholastic Aptitude Test, standing in senior class, and recommendation of high school or college instructors. Some outstanding students may be admitted to the program in the middle of the freshman year or at the beginning of the sophomore year.

The program consists of special classes in business and nonbusiness subjects that are required for the bachelor's degree in the School of Business Administration. Through this plan a student may pursue any one of the majors and options within the School of Business Administration. The student who graduates under this program will have the best possible preparation for graduate and professional work in business administration and will be awarded a special display certificate designating him an Honors Plan graduate.

Bachelor of Business Administration. This degree will be awarded to all students who elect the degree and who have fulfilled the minimum requirements as follows:

1. The specific course requirements for majors in accounting, advertising, business education, economics, finance, industrial management, international trade, management, marketing, prelaw, public administration, retailing, or secretarial administration.
2. Additional courses approved by the major adviser to complete the degree program.
3. A minimum grade-point average of 2.00 in all business administration subjects.
4. A total number of semester hours as stated for the major with a minimum grade-point average of 2.00. In addition, a minimum of four semesters of freshman and sophomore physical education, band, or basic ROTC must be completed.
5. Application for the degree made through the office of the Dean of Business Administration at least one year in advance of the proposed graduation date.
6. Completion of a personnel data file with the Placement Service.

Bachelor of Science. This degree will be awarded to all students who elect the degree and who have completed the minimum requirements as follows:

1. The specific course requirements for majors in economics, international trade, or public administration.
- 2, 3, 4, 5, and 6. Same as for the degree of Bachelor of Business Administration.

General Curricula Requirements.

I. Nonprofessional courses (49 semester hours):

ECO 133—The Development of American Business and Economic Institutions I

Special sections are available for Honors Plan students.

ECO 231, 232—Principles of Economics I and II

Special sections are available for Honors Plan students.

ENG 131, 132—College Rhetoric

Honors Plan students should register for 133H, 134H.

ENG 231 or 232—Masterpieces of Literature

Special sections are available for Honors Plan students.

GOVT 231—American Government, Organization

GOVT 232—American Government, Functions

MGT 110—Professional Careers in Business

Not to be taken by Honors Plan students.

MATH 137, 138—Mathematical Analysis

Special sections are available for Honors Plan students.

Industrial Management majors are to substitute MATH 151 and 152.

Physical Education, Band, or Basic ROTC—four semesters, but hours not counted for degree

Science—6 semester hours

Industrial Management majors are to take CHEM 141, 142 or PHYS 141, 142.

SPCH 338—Business and Professional Speech

Honors Plan students should register for SPCH 131H.

American History—6 semester hours

Humanities—3 semester hours as approved by the major adviser from one of the following fields (list of approved courses is available from adviser or office of the dean):

Art
Anthropology
English
Foreign Language
Music Literature
Philosophy
Psychology
Sociology

II. Basic professional courses (31 semester hours):

ACCT 232—Electronic Data Processing I
ACCT 234, 235—Elementary Accounting I and II

Special sections are available for Honors Plan students.

BLAW 338, 339—Business Law I and II

Not to be taken by prelaw majors.

Honors Plan students should register for BLAW 339H only.

FIN 331—Corporation Finance

Special sections are available for Honors Plan students.

MGT 331—Industrial Management

Special sections are available for Honors Plan students.

MKT 246—Introduction to Business Statistics

Special sections are available for Honors Plan students.

MKT 332—Principles of Marketing

Special sections are available for Honors Plan students.

SECT 333—Business Correspondence

Special sections are available for Honors Plan students.

III. Major professional courses as listed in departmental curricula. The student who is given permission to substitute for a group III course should make certain that the permission from the adviser is **at that time** recorded on the proper school form made out in triplicate, the original copy to be placed on file in the office of the dean, the first carbon copy to be retained by the adviser, and the second carbon copy to be preserved carefully by the student. The school assumes no obligation for substitutions claimed by the student unless he can present when needed his copy of the substitution form.

IV. Electives.

Honors Plan students are expected to complete BAD 441H—Seminar in Business Administration and BAD 422H—Business Policy Research and Report. The American Association of Collegiate Schools of Business prescribes that not less than 40 percent of the total hours required for graduation must be in business and economic subjects, and not less than 40 percent must be in subjects other than business and economics. Freshman and sophomore physical education, band, and basic ROTC are excluded from this computation. ECO 133, 231, and 232 may be counted as nonbusiness courses. The student may need to use part of the Group IV electives to assure the required amount of nonbusiness work.

Bachelor of Business Administration—Prelaw Major. Schools of law do not normally prescribe specific courses as part of their admission requirements. Some admit only persons who hold baccalaureate degrees, while others admit students who have completed three years of college. The School of Business Administration has a three-year prelaw program which gives the student a good background in the business world.

I. Nonprofessional courses (49 semester hours).

Prelaw students should elect a semester of sophomore literature as an elective humanity in addition to the 9 hours of required English in order to meet admission requirements of some law schools.

II. Basic professional courses (25 semester hours).

III. Major professional courses (13 semester hours):

Accounting elective, 3 semester hours

ECO 326—Research in Economics and Business

SECT 327—Report Writing

Electives—6 semester hours to be chosen from the following:

ANTH 231—The Origin and Nature of Man

or ANTH 232—Cultural Anthropology

HIST 133, 134—History of England

PSY 230—General Psychology I

SOC 230—Introduction to Sociology
or SOC 233—Current Social Problems
Advanced business administration courses

- IV. Electives in business administration to complete a total of 95 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. Students should attempt to elect courses which will provide the most information concerning the areas of business activity in which it is anticipated legal practice will concentrate. It may be necessary to use a part of these electives to assure a required total of not less than 38 academic hours of course work outside the School of Business Administration.

Bachelor of Business Administration or Bachelor of Science—Public Administration Major. This program prepares students for positions in municipal government in the fields of purchasing, budgeting, finance, personnel, research, and management. The suggested courses provide a wide preparation in the science of administration.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (40 semester hours):
ACCT 432—Governmental Accounting
ARCH 337—Principles of City Planning
ECO 326—Research in Economics and Business
ECO 334—Taxation and Public Expenditures
GOVT 4321—Local Government
GOVT 4343—Local Administration
GOVT 4344—Government of Metropolitan Areas
MGT 334—Personnel Administration I
MGT 335—Purchasing, Stores, and Inventory Control
MGT 435—Employee Supervision
MKT 331—Public Relations
PSY 230—General Psychology I
SECT 327—Report Writing
SECT 431—Internship
- IV. Electives to complete a total of 130 semester hours, exclusive of freshman and sophomore physical education, band or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 52 academic hours of course work outside the School of Business Administration.

Bachelor of Business Administration or Bachelor of Science—General Business Major. The curriculum in general business recognizes the growing complexity of business, which requires coordination and integration with many fields of study taught outside the School of Business Administration. The program is offered to provide opportunity to a student who can satisfy the demand for qualified personnel with a background in business plus an area of concentration other than in the School of Business Administration. The area of concentration may be selected from any recognized department in the College.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Nonbusiness area of concentration (30 semester hours minimum). Students interested in this program should confer with the assistant dean to select a department to which he will go to receive recommendation of a minimum of 30 semester hours of course work. Once approval has been received, the listed courses will become an official part of his required courses.
- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. A minimum of 12 semester hours in business administration is required. Not less than 40 percent of the total hours required for graduation must be in subjects other than business and economics. ECO 133, 231, and 232 may be counted as business or nonbusiness courses. The student may need to use part of the Group IV electives to assure the required amount of business or nonbusiness work.

Suggested Programs for Business Administration Curricula, 1968-1969.

(Refer to Appropriate Statements of Degree Requirements)

YEAR	ACCOUNTING		ADMINISTRATIVE MANAGEMENT		ADVERTISING		BUSINESS EDUCATION	
	FALL	SPRING	FALL	SPRING	FALL	SPRING	FALL	SPRING
FIRST	ACCT 232 ENG 131 HIST 231 MGT 110 MATH 137 P.E. Science	ECO 133 ENG 132 HIST 232 MATH 138 P.E. Science	ECO 133 ENG 131 Humanities MGT 110 MATH 137 P.E. Science	ACCT 232 ENG 132 HIST 231 MATH 138 P.E. Science	ECO 133 ENG 131 MGT 110 MATH 137 HIST 231 Science P.E.	ACCT 232 ENG 132 MATH 138 HIST 232 Science P.E.	ECO 133 ENG 131 HIST 231 MATH 137 MGT 110 SECT 122 P.E.	ACCT 232 ENG 132 HIST 232 MATH 138 SECT 123 SECT 131
	ACCT 234 ECO 231 ENG 231 GOVT or 232 GOVT 231 Humanities P.E.	ACCT 235 ECO 232 GOVT 232 SPCH 338 P.E.	ACCT 234 ECO 231 ENG 231 GOVT 231 SECT 333 P.E.	ACCT 235 ECO 232 GOVT 232 HIST 232 MKT 246 P.E.	ACCT 234 ECO 231 ENG 232 GOVT or 231 GOVT 231 P.E.	ACCT 235 ECO 232 GOVT 232 MKT 334 MKT 332 ART 321 P.E.	ACCT 234 ECO 231 ENG 231 Science SECT 231 P.E.	ACCT 235 ECO 232 ENG 232 GOVT 231 MKT 246 P.E.
THIRD	ACCT 334 ACCT 336 BLAW 338 MKT 332 SECT 333	ACCT 335 BLAW 339 FIN 331 MKT 246 Acct. Elect.	ACCT 331 BLAW 338 MGT 335 MGT 331 MKT 332	BLAW 339 FIN 331 MGT 334 MGT 4331 SPCH 338	BLAW 338 FIN 331 MKT 246 JOUR 3351 MKT 4311	ACCT 331 BLAW 339 Humanities MGT 331 MKT 4312	BLAW 338 S ED 330 ED 332 GOVT 232 MKT 332 SECT 321	BLAW 339 S ED 334 Science SECT 232 SECT 322 SECT 327 P.E.
FOURTH	ACCT 430 ACCT 434 ACCT 437 SECT 327	MGT 331 Acct. Elect. Acct. Elect.	MGT 430 MGT 431 Second Field Elective	MGT 432 MGT 435 MGT 442 Second Field	MKT 436 SPCH 338 SECT 333	MKT 4316 MKT 433 MKT 335	<p>Student Teaching semester may be either fall or spring</p> <p>Non Student Teaching Semester</p> <p>B ED 432</p> <p>B ED 433</p> <p>MGT 331</p> <p>SECT 333</p> <p>SPCH 338</p> <p>Student Teaching Semester</p> <p>S ED 436</p> <p>S ED 462</p> <p>FIN 331</p> <p>Evidence of at least eight weeks of continuous full-time business experience.</p>	

Suggested Programs for Business Administration Curricula, 1968-1969.

(Continued)

(Refer to Appropriate Statements of Degree Requirements)

YEAR	ECONOMICS		GENERAL BUSINESS		FINANCE--Banking		FINANCE Financial Administration	
	FALL	SPRING	FALL	SPRING	FALL	SPRING	FALL	SPRING
FIRST	ECO 133	ACCT 232	ACCT 232	ECO 133	ECO 133	ACCT 232	ECO 133	ACCT 232
	ENG 131	ENG 132	ENG 131	ENG 132	ENG 131	ENG 132	ENG 131	ENG 132
	HIST 231	HIST 232	HIST 231	HIST 232	HIST 231	HIST 232	HIST 231	HIST 232
	MGT 110	MATH 138	MGT 110	MATH 138	MGT 110	MATH 138	MGT 110	MATH 138
	MATH 137	P.E. Science	MATH 137	P.E. Science	MATH 137	P.E. Science	MATH 137	P.E. Science
SECOND	ACCT 234	ACCT 235	ACCT 234	ACCT 235	ACCT 234	ACCT 235	ACCT 234	ACCT 235
	ECO 231	ECO 232	ECO 231	ECO 232	ECO 231	ECO 232	ECO 231	ECO 232
	ENG 231	GOVT 232	ENG 231	GOVT 232	ENG 231	GOVT 232	ENG 231	GOVT 232
	GOVT or 232	Humanities	GOVT or 232	SPCH 338	GOVT or 232	Humanities	GOVT or 232	Humanities
	SPCH 338	P.E. Elective	P.E. Elective	P.E. Elective	P.E. Elective	P.E. Elective	P.E. Elective	P.E. Elective
THIRD	ACCT 331	BLAW 339	MKT 332	FIN 331	BLAW 338	ACCT 332	ACCT 334	ACCT 335
	or 332	ECO 3311	SECT 333	Humanities	FIN 331	BLAW 339	BLAW 338	BLAW 339
	BLAW 338	MGT 331	MGT 331	246	FIN 333	MKT 332	FIN 331	MKT 332
	ECO 3314	MKT 246	NBAC* 3 hrs.	NBAC* 3 hrs.	FIN 335	MKT 246	FIN 333	MKT 246
	FIN 331		ABE** 3 hrs.	ABE** 3 hrs.	ECO 331		FIN 335	ECO 331
FOURTH	ECO 430	ECO 4312	BLAW 338	BLAW 339	FIN 431	FIN 433	ACCT 430	ACCT 439
	SECT 333	ECO 4311	NBAC* 9 hrs.	NBAC* 9 hrs.	FIN 434	FIN 438	FIN 431	FIN 433
	Approved Electives	Approved Electives	ABE** 3 hrs.	ABE** 3 hrs.	SECT 333	FIN 4311	FIN 434	FIN 4311
					MGT 331	SECT 327	SECT 327	SECT 327
					Elective	Electives	MGT 331	Electives

* Non business area of concentration
 **Approved business elective

Suggested Programs for Business Administration Curricula, 1968-1969.

(Continued)

(Refer to Appropriate Statements of Degree Requirements)

YEAR	FINANCE Insurance and Real Estate		INDUSTRIAL MANAGEMENT		INTERNATIONAL TRADE		MARKETING	
	FALL	SPRING	FALL	SPRING	FALL	SPRING	FALL	SPRING
FIRST	ECO 133	ACCT 232	ECO 133	ACCT 232	ECO 133	ACCT 232	ECO 133	ENG 132
	ENG 131	ENG 132	ENG 131	ENG 132	ENG 131	ENG 132	ENG 131	ACCT 232
	HIST 231	HIST 232	MGT 110	MATH 152	HIST 231	HIST 232	MGT 110	MATH 138
	MGT 110	MATH 138	MATH 151	P.E.	MGT 110	MATH 138	PSY 230	Humanities
	MATH 137	P.E.	P.E.	Gen. Chem. or Gen. Phys.	MATH 137	P.E.	Science	Science
SECOND	P.E.	Science	Gen. Chem. or Gen. Phys.		P.E.	Science	P.E.	P.E.
	Science				Science		MATH 137	
	ACCT 234	ACCT 235	ACCT 234	ACCT 235	ACCT 234	ACCT 235	ACCT 234	ACCT 235
	ECO 231	ECO 232	ECO 231	ECO 232	ECO 231	ECO 232	ECO 231	ECO 232
	ENG 231	GOVT 232	ENG 231	GOVT 232	ENG 231	ECO 237	ENG 231	GOVT 232
THIRD	GOVT 231	Humanities	GOVT 231	MGT 232	GOVT 231	GOVT 232	GOVT or 232	HIST 232
	P.E.	Elective	Humanities	MKT 246	P.E.	Humanities	GOVT 231	MKT 246
	Elective	P.E.	P.E.		SPCH 338	P.E.	HIST 231	P.E.
		SPCH 338					P.E.	
FOURTH	BLAW 338	ACCT 332	BLAW 338	BLAW 339	BLAW 338	BLAW 339	MKT 332	MKT 335
	FIN 331	BLAW 339	MGT 331	MKT 332	ECO 338	ECO 339	MKT 334	MKT 434
	FIN 333	FIN 336	MGT 332	FIN 331	FIN 331	MGT 331	BLAW 338	BLAW 339
	FIN 335	MKT 332	SECT 333	HIST 231	GOVT 4361	MKT 246	FIN 331	MGT 331
	ECO 331	MKT 246	SPCH 338	MGT 336	MKT 332	SECT 333	ACCT 336	SECT 333
FOURTH							or 332	
	BLAW 3312	BLAW 3311	ACCT 336	HIST 232	ACCT 331	GOVT 4363	MKT 439	MKT 433
	FIN 432	FIN 434	MGT 432	MGT 439	or 332	GOVT 4364	MKT 436	MKT 435
	FIN 435	FIN 439	MGT 435	I E 3331	ECO 337	GOVT 4362	MGT 432	SPCH 338
	MGT 331	SECT 327	MGT 438	MGT 432	ECO 430	Electives	MKT 432	
FOURTH	Elective	SECT 333	ECO 331	Elective	ECO 433		MKT 339	
		Elective			ECO 437			

Suggested Programs for Business Administration Curricula, 1968-1969.
(Continued)

Suggested Programs for Business Administration Curricula, 1968-1969.

(Continued)

(Refer to Appropriate Statements of Degree Requirements)

	RETAILING				SECRETARIAL ADMINISTRATION				TRAFFIC MANAGEMENT			
YEAR	FALL		SPRING		FALL		SPRING		FALL		SPRING	
FIRST	ECO	133	ACCT	232	ENG	131	ACCT	232	ECO	133	ACCT	232
	ENG	131	ENG	132	ECO	133	ENG	132	ENG	131	ENG	132
	MATH	137	MATH	138	MGT	110	MATH	138	Humanities		HIST	231
	MGT	110	PHIL	231	MATH	137	SECT	123	MGT	110	MATH	138
	PSY	230	Science		SECT	122	SECT	131	MATH	137	P.E.	
	Science		P.E.		P.E.		Science		P.E.		Science	
	P.E.								Science			
SECOND	ACCT	234	ACCT	235	ACCT	234	ACCT	235	ACCT	234	ACCT	235
	ECO	231	ECO	232	GOVT	231	GOVT	232	ECO	231	ECO	232
	GOVT	231	GOVT	232	ECO	231	ECO	232	ENG	231	GOVT	232
	HIST	231	HIST	232	SECT	231	SECT	232	GOVT	231	HIST	232
	ENG	231	MKT	332	Science		ENG	231	SECT	333	MKT	246
	P.E.	or 232	P.E.		P.E.		P.E.	or 232	P.E.		P.E.	
THIRD	BLAW	338	BLAW	339	BLAW	338	BLAW	339	BLAW	338	BLAW	339
	ACCT	331	MGT	331	HIST	231	HIST	232	ECO	336	FIN	331
	FIN	331	MKT	335	MKT	246	MGT	331	MGT	3381	MKT	332
	MKT	334	MKT	246	SECT	321	SECT	322	MGT	331	MGT	334
	SECT	333	MGT	336	SECT	331	SECT	333	MGT	3371	SPCH	338
							P.E.					
FOURTH	SPCH	338	ECO	331	MGT	339	FIN	331	ACCT	331	I E	421
	MKT	436	MKT	433	MKT	332	MGT	436	I E	335	MGT	4371
	MKT	4315	MKT	4319	SECT	327	SECT	332	MGT	335	MGT	4381
	Humanities				Humanities		SECT	431	MGT	435	MGT	432
							SPCH	338	MGT	4331	Electives	

Department of Accounting

This department supervises the following degree programs: *ACCOUNTING, Bachelor of Business Administration, Master of Business Administration, Master of Science in Accounting*. The department cooperates in the program leading to the *Doctor of Business Administration* degree.

The undergraduate degree requirements are listed in the table below.

Bachelor of Business Administration—Accounting Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (29 semester hours):
 - ACCT 334, 335—Intermediate Accounting I and II
 - ACCT 336—Principles of Cost Accounting
 - ACCT 430—Income Tax Accounting
 - ACCT 434—Advanced Accounting I
 - ACCT 437—Principles of Auditing
 - Accounting electives—9 semester hours
 - SECT 327—Report Writing
- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Courses in Accounting.

FOR UNDERGRADUATES

121. **Elementary Mechanical Coding (2:2:2).** Students achieve proficiency with the keypunch, verifier, alpha-numeric keyboards, drills, program cards, card format, and coding.
231. **Industrial Accounting for Engineers (3:3:0).** A basic accounting course combining a managerial approach to financial accounting with a highly condensed presentation of the principles and procedures of accounting.
232. **Electronic Data Processing I (3:3:0).** A study of general purpose, digital, electronic computers and applications adaptable to automation; computer fundamentals, flowcharts, programming, basic COBOL and FORTRAN-IV, systems, control, and data cards.
233. **Electronic Data Processing II (3:3:0).** Prerequisite: ACCT 232. An advanced study of large, tape-controlled, general purpose, digital computers and suitable applications; programming in COBOL and FORTRAN-IV beyond the basic subset.
234. **Elementary Accounting I (3:3:1).** Accounting for merchandise operations, proprietorships, partnerships, negotiable instruments, specialized books of original entry, and the voucher system. Credit will not be given for both 231 and 234.
235. **Elementary Accounting II (3:3:1).** Second course in elementary accounting. Partnerships, corporations, cost accounting, assets, theory, and principles of accounting, and interpretation of financial statements.
246. **Unit Record Data Processing I (4:3:3).** Punched card methods; card format and coding; organization and operation of tabulating machines departments; applications. Wire panel boards; operate the printing punch, verifier, sorter, tabulator.
247. **Unit Record Data Processing II (4:3:3).** Wire panel boards, operate the keypunch, interpreter, reproducer, and collator. Study unit record accounting applications and systems for payroll, inventory, billing, sales, management, accounts payable and receivable, supervisor responsibility, and procedure development.
322. **Payroll Accounting (2:2:0).** Theory and application of federal and state laws pertaining to payroll, such as wage and hour, withholding, unemployment, workmen's compensation, and employment benefits.
323. **Introduction to Income Taxation for Individuals (2:2:0).** For nonaccounting majors only. A study of origin and development of basic concepts. Involves preparation of individual tax returns.
331. **Managerial Accounting (3:3:0).** Prerequisite: ACCT 235 and nonaccounting major. Accounting information as an aid to management decision making; emphasizes the use of budgets, standard costs, and relevant costs by management.
332. **Analysis of Financial Statements (3:3:0).** Prerequisite: ACCT 235 and nonaccounting major. The theoretical foundation of the balance sheet and the income statement, and a survey of the techniques available for analyzing these two statements.
334. **Intermediate Accounting I (3:3:0).** Prerequisite: ACCT 235. Review of elementary accounting, net income concepts, corporations, current assets, investments.
335. **Intermediate Accounting II (3:3:0).** Fixed assets, liabilities and reserves, interpretation and analysis of financial statements, application of funds, cash flow statement, reorganizations, price level impact on financial statements.
336. **Principles of Cost Accounting (3:3:0).** Principles and techniques of cost accounting for product costing, control, and decision making. Consideration of prime costs, factory overhead, budgeting, and transfer pricing.

FOR UNDERGRADUATES AND NONBUSINESS GRADUATES

421. **Accounting Reports (2:2:0).**
430. **Income Tax Accounting (3:3:0).** Prerequisite: ACCT 234. A study in detail of certain provisions of the Internal Revenue Code, combined with elementary tax planning in business and individual transactions.
431. **Advanced Income Tax Accounting (3:3:0).** Prerequisite: ACCT 430. Methodology in income tax research and planning. Case studies used for corporate and individual problem solutions.

432. **Governmental Accounting (3:3:0)**. Prerequisite: ACCT 235. Application of accounting principles and systems to the requirements of governmental units, municipal, county, state, and federal. Emphasis on budgetary and fund accounts.
433. **Petroleum Accounting (3:3:0)**. Prerequisite: ACCT 235. Accounting for the production, refining, and distribution of oil, with emphasis upon production.
434. **Advanced Accounting I (3:3:0)**. Prerequisite: ACCT 334, 335. Partnerships, ventures, installment sales, consignments, bankruptcies and receiverships, estates and trusts, actuarial science.
435. **Advanced Accounting II (3:3:0)**. Home office and branch accounting, consolidations, governmental units, insurance.
436. **Accounting Systems (3:3:0)**. Prerequisite: ACCT 235. The theories, procedures, and techniques of designing information systems for organizations that maintain financial records.
437. **Principles of Auditing (3:3:0)**. Prerequisite: ACCT 335. A study of system based independent audits including auditing objectives, procedures, internal control, working papers and reporting on the fairness of financial statements.
438. **Advanced Auditing (3:3:0)**. Prerequisite: ACCT 437. Readings in auditing. Review of auditing standards; case studies in auditing procedures and reporting.
439. **Budgeting (3:3:0)**. The use of accounting in the profit-planning process. The operating and financial budgets; flexible expense budgets; reports; and supplementary budgetary statistics.
4313. **Advanced Cost Accounting (3:3:0)**. Prerequisite: ACCT 336. Advanced theory and techniques of process cost are more fully developed than in ACCT 336 and the scope of applicability broadened.

FOR GRADUATES

531. **Controllorship (3:3:0)**. Role of the controller in business.
532. **Internship (3:3:0)**. A student is placed in an internship in accounting and upon completion writes a report of his internship.
533. **Current Accounting Theory (3:3:0)**. Current accounting literature; accounting bulletins of the American Institute of Certified Public Accountants; S.E.C. accounting releases.
535. **Seminar in Accounting (3:3:0)**. Comprehensive study of some phase of accounting, such as internal auditing, accounting for the federal government, auditing of specific enterprises, accounting for fiduciaries and estates, advanced cost problems, and advanced machine accounting.
536. **CPA Review I (3:3:0)**. Emphasis on subject matter appearing in the practice part of the CPA examinations.
537. **CPA Review II (3:3:0)**. Emphasis on subject matter appearing in the theory part of the CPA examinations.
538. **Advanced Corporation Accounting (3:3:0)**. Prerequisite: 12 hours of advanced accounting or consent of instructor. Problems and theory: corporate equities, capital adjustments, reorganizations, dissolutions, business combinations, financial reporting.
539. **Seminar in Federal Taxes (3:3:0)**. Intensive tax research and planning through case studies of complex problems in areas of federal income, gift, and estate taxation.
5311. **Advanced Accounting Problems I (3:3:0)**. A study of advanced accounting problems varying with the needs of the particular students. Individual instruction.
5312. **Advanced Accounting Problems II (3:3:0)**. A study of advanced accounting problems varying with the needs of the particular students. Individual instruction.
5314. **Procedural Aspects of Federal Taxation (3:3:0)**. Investigations into the enforcement area for all federal taxes, including organization and operation of the Internal Revenue Service as they influence the tax practitioner.
5315. **Estate, Trust, and Gift Taxation (3:3:0)**. Intensive study of federal income taxation of the estate and trust entities and the transfer of property rights through gifts.
5316. **Oil and Gas Taxation (3:3:0)**. Analysis of oil and gas transactions under provisions of federal income tax laws. Studies of current practices in planning petroleum transactions.
5317. **Accounting and Analytical Methods (3:3:0)**. The role of modern measurement theory in accounting; formulation of accounting hypotheses; budget models for the firm; and the application of mathematical models to the accounting process.
5318. **Income Tax Research and Planning (3:3:0)**. Fundamental procedures in research of income tax subject areas, as: depreciation, inventories, etc. Principles involved in necessary planning of actions for a desired tax result.
5319. **Advanced Auditing for Graduate Students (3:3:0)**. Readings in auditing. Review of auditing standards; case studies in auditing procedures and reporting.
5320. **Industrial Cost Control (3:3:0)**. Emphasis is on the use of operating data by management for control purposes.
5341. **Managerial Accounting I (3:3:0)**. Prerequisite: ACCT 235 or 5531 and limited to non-accounting majors. Uses of accounting to business as well as the interpretation of financial statements and accounting reports.
5351. **Advanced Accounting Theory and Practice (3:3:0)**. Development of accounting theory and practice. Objectives and limitations of accounting and survey of accounting areas as they relate to the business environment.
5531. **Principles of Accounting (5:5:0)**. Survey of accounting procedures, accumulation of information regarding the accounting entity and interpretation for control purposes and managerial decisions.
5541. **Managerial Accounting II (5:5:0)**. A detailed analysis of financial statements and corporate accounts. Accumulation of cost information and interpretation of the results as an aid to managerial decisions.
731. **Research (3)**.

Business Administration

Courses in Business Administration.*

FOR UNDERGRADUATES

- 422H. **Business Policy Research and Report (3)**. Prerequisite: B AD 441H. Individual student investigation of some specific business problem under the personal direction of a scholar in the specialized field. Written report required.

* Participation by all departments in the School of Business Administration.

- 441H. **Seminar in Business Administration (4:4:0).** Prerequisite: Permission of Honors Plan Director. Integrating course in policy formulation and administration. Student will draw on his knowledge of all the areas of business in solving organization problems.

FOR GRADUATES

5341. **Research Methods in Business (3:3:0).** Prerequisite: Graduate standing; consent of instructor. A study of the scientific research methods in business.
5342. **Business Policy (3:3:0).** Prerequisite: Graduate standing; consent of adviser. A course in policy formulation and policy implementation that integrates for the student the separate areas of business study.
5351. **Business and Its Environment (3:3:0).** Prerequisite: Graduate standing. A consideration of the position of today's business in the light of those concepts which are the foundations of our society.
5352. **Research Methods and Management (3:3:0).** Prerequisite: Graduate standing; permission of instructor. A study of scientific research methods, and the administrative and environmental aspects of the management of research personnel.
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required at least twice.
831. **Doctor's Dissertation (3).** Enrollment required at least four times.

Department of Business Education and Secretarial Administration

This department supervises the following degree programs: **BUSINESS EDUCATION**, *Bachelor of Business Administration*, *Master of Business Administration*, *Master of Education*; **SECRETARIAL ADMINISTRATION**, *Bachelor of Business Administration*. The department also participates in the **LATIN AMERICAN AREA STUDIES** program leading to a *Bachelor of Arts* degree and the program leading to the *Doctor of Business Administration* degree.

The undergraduate degree requirements are listed in the tables below.

Bachelor of Business Administration—Business Education Major.

- I. Nonprofessional courses* (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (43 semester hours):
 - B ED 432—Teaching Business Subjects I
 - B ED 433—Teaching Business Subjects II**
 - S ED 330—Principles of Secondary Education
 - ED 332—Educational Psychology
 - S ED 334—Curriculum Development in Secondary Education
 - S ED 436—Teaching in Secondary Schools
 - S ED 462—Student Teaching
 - SECT 122—Typewriting for Business I
 - SECT 123—Typewriting for Business II**
 - SECT 131—Shorthand Theory**
 - SECT 231—Dictation and Transcription**
 - SECT 232—Advanced Dictation and Transcription**
 - SECT 321—Office Machines I
 - SECT 322—Office Machines II**
 - SECT 327—Report Writing**
- IV. Electives to complete a total of 129 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 52 academic hours of course work outside the School of Business Administration.
- V. Evidence of at least eight weeks of continuous, full-time business experience.

Bachelor of Business Administration—Management Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (39 to 42 semester hours):
 - ACCT 331—Managerial Accounting
 - or ACCT 334—Intermediate Accounting
 - MGT 4331—Collective Bargaining
 - MGT 334—Personnel Administration I
 - MGT 432—Administrative Policy
 - MGT 435—Employee Supervision
 - Additional approved electives—20-27 semester hours.

* Only biology, chemistry, geology, or physics may be used to meet the science requirement.

** With approval of adviser, substitute other hours if pursuing Plan I for teacher certification.

- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Bachelor of Business Administration—Secretarial Administration Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (34 semester hours):
 - MGT 339—Office Management
 - MGT 436—Systems and Procedures
 - SECT 122—Typewriting for Business I
 - SECT 123—Typewriting for Business II
 - SECT 131—Shorthand Theory
 - SECT 231—Dictation and Transcription
 - SECT 232—Advanced Dictation and Transcription
 - SECT 321—Office Machines I
 - SECT 322—Office Machines II
 - SECT 327—Report Writing
 - SECT 331—Secretarial Practice
 - SECT 332—Secretarial Procedures
 - SECT 431—Internship
- IV. Electives to complete a total of 129 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 52 academic hours of course work outside the School of Business Administration.

Courses in Business Education.

FOR UNDERGRADUATES AND NONBUSINESS GRADUATES

432. **Methods of Teaching Business Subjects I (3:3:0).** Prerequisite: AOCT 235, BLAW 339, ECO 232. Business education as a profession. Methods, content, and materials to teach basic business subjects, bookkeeping, and office machines.
433. **Methods of Teaching Business Subjects II (3:3:0).** Prerequisite: At least a C grade in both SECT 122 and 231 or equivalents. Methods, content, and materials to teach typewriting, shorthand, transcription, and secretarial procedures.

FOR GRADUATES

530. **Foundations of Business Education (3:3:0).** A historical study of business education principles.
535. **Seminar in Business Education (3:3:0).** Analysis of business education areas including curriculum, guidance, administration, supervision, evaluation, and economic education.
536. **Research and Improvement of Instruction in Bookkeeping (3:3:0).** Prerequisite: B ED 432. Study of content, methods, and research to improve the instruction of bookkeeping.
537. **Research and Improvement of Instruction in Office Procedures (3:3:0).** Prerequisite: B ED 432 and MGT 331 or 339. Study of content, methods, and research to improve the instruction and performances in office procedures.
538. **Research and Improvement of Instruction in Shorthand (3:3:0).** Prerequisite: B ED 433. Study of content, methods, and research to improve the instruction of shorthand theory, diction, and transcription.
539. **Research and Improvement of Instruction in Typewriting (3:3:0).** Prerequisite: B ED 433. Study of content, methods, and research to improve the instruction of typewriting.
5311. **Organization and Administration of Vocational Education (3:3:0).** Prerequisite: Graduate standing. The objectives, principles, and procedures for organizing and administering vocational education programs in high school, junior college, and adult education programs.
5312. **Cooperative Vocational Education Programs (3:3:0).** Prerequisite: Graduate standing. The objectives, principles, and procedures for establishing, coordinating, and teaching cooperative work-study programs in high school, junior college, and adult education programs.
5331. **Problems in Business Education (3:3:0).** Identification and analysis of contemporary business education problems. May be repeated for credit.
5351. **Collegiate Education for Business (3:3:0).** Prerequisite: Graduate standing. To assist prospective teachers in collegiate schools of business and management personnel in business and industry to develop a personal philosophy of education for business and to develop their teaching abilities.
731. **Research (3).**

Courses in Secretarial Administration.

FOR UNDERGRADUATES

121. **Beginning Typewriting (2:2:3).** Basic course in touch typewriting. No credit for those with one year of previous typewriting instruction.
122. **Typewriting for Business I (2:2:2).** Prerequisite: At least a C grade in SECT 121 or equivalent. Development and application of basic typewriting ability to such communications media as correspondence, reports, statistical data, and business forms.
123. **Typewriting for Business II (2:2:2).** Prerequisite: At least a C grade in SECT 122 or equivalent. Problems in arranging and displaying data and messages in effective type-

written form for managerial use. Preparation of masters for duplicating processes. Electric typewriting.

131. **Shorthand Theory (3:3:2)**. Corequisite: SECT 122. Theory of Gregg system. Development of basic shorthand vocabulary. Recording and transcribing timed dictation of business communications.
231. **Dictation and Transcription (3:3:2)**. Prerequisite: At least a C grade in both SECT 122 and 131. Expansion and automatization of shorthand vocabulary. Building of speed and accuracy in note taking. Typewritten transcripts.
232. **Advanced Dictation and Transcription (3:3:2)**. Prerequisite: At least a grade of C in SECT 231 or equivalent. Development of ability to transcribe mailable business communications. Introduction of office-style dictation. Specialized business vocabulary.
321. **Office Machines I (2:2:2)**. Prerequisite: ACCT 235. Numerical data processing machines and systems to decrease office expenses. Operation of calculating and accounting machines.
322. **Office Machines II (2:2:2)**. Prerequisite: SECT 122. Communication and duplication machine processes and systems. Operation of dictating, transcribing, and duplicating machines.
327. **Report Writing (2:2:0)**. Prerequisite: Junior standing, SECT 121, or typewriting ability. Composing effective business reports. Emphasis on business reporting procedures and solving internal business reporting problems.
331. **Secretarial Practice (3:3:0)**. Prerequisite: SECT 232. Analysis of interpersonal relations in the office. Business ethics and etiquette. Transcription of office-style dictation.
332. **Secretarial Procedures (3:3:0)**. Prerequisite: SECT 122. Scope of the secretarial profession. Supervision of office personnel. Records management; responsibilities in financial, legal, and other office administration matters.
333. **Business Correspondence (3:3:0)**. Prerequisite: Junior standing, SECT 121, or typewriting ability. Composing psychologically sound business letters in correct and forceful English. Emphasis on solving business problems encountered in writing effective business letters.
431. **Internship (3:1:5)**. Prerequisite: Senior classification and approval of instructor. Supervised business experience for minimum of 90 hours. Internship coordinated with lectures. Analysis and improvement of work operations.

Department of Economics

This department supervises the following degree programs: *ECONOMICS, Bachelor of Business Administration, Bachelor of Science, Bachelor of Arts, Master of Arts, Master of Business Administration*; *INTERNATIONAL TRADE, Bachelor of Business Administration, Bachelor of Science*. The department also participates in the program leading to the degree of *Doctor of Business Administration*. The requirements for the *Bachelor of Arts* degree are given in the Arts and Sciences section of this catalog. A minimum of 30 semester hours in economics courses approved by the chairman is required for a major in economics. The requirements for the other undergraduate degrees are given in the tables below.

Bachelor of Business Administration or Bachelor of Science—Economics Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (36 semester hours):
 - ACCT 331—Managerial Accounting
 - or ACCT 332—Analysis of Financial Statements
 - ECO 331—National Income Analysis
 - ECO 334—Intermediate Economic Theory
 - ECO 430—Development of Economic Doctrines
 - ECO 431—Advanced Economic Theory
 - ECO 432—Macrodynamic Economics
 - Approved electives—18 semester hours
- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Bachelor of Business Administration or Bachelor of Science—International Trade Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (36 semester hours):
 - ACCT 331—Managerial Accounting
 - or ACCT 332—Analysis of Financial Statements
 - ECO 237—Economic Geography
 - ECO 337—Economic Systems
 - ECO 338—Foreign Trade
 - ECO 339—Latin America and the United States
 - ECO 430—Development of Economic Doctrines
 - ECO 433—International Economic Relations

ECO 437—Current Economic Problems
 GOVT 4361—United States Foreign Policy
 GOVT 4362—Political Geography
 GOVT 4363—International Organization
 GOVT 4364—International Law

- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Courses in Economics.

FOR UNDERGRADUATES

133. **The Development of American Business and Economic Institutions I (3:3:0).** An analysis of how the contemporary American economy has evolved. Emphasis on the use of scientific tools to dissect problems; and comparisons of the characteristics of business institutions and the economic process in different eras.
134. **The Development of American Business and Economic Institutions II (3:3:0).** Prerequisite: ECO 133. A continuation of ECO 133, with primary emphasis upon application of tools of analysis to problems associated with the development of American business and economic institutions most closely related to the contemporary environment.
231. **Principles of Economics I (3:3:0).** An introduction to modern economic society and theories of production and exchange. Emphasis upon monetary and fiscal policy and macroeconomics. Credit will not be given for both 231 and 235.
232. **Principles of Economics II (3:3:0).** Prerequisite: ECO 231. A continuation of ECO 231. 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.
235. **Principles of Economics (3:3:0).** An abridged course for students not majoring in economics or business administration. Covers the most significant portions of ECO 231 and 232, with emphasis upon monetary and fiscal policy. Credit will not be given for both 231 and 235.
237. **Economic Geography (3:3:0).** The characteristics and distribution of man's economic pursuits, his relation to natural conditions and resources, and his significance in the economics of the major regions of the world order.
326. **Research in Economics and Business (2:2:0).** Research methods used in the field. A definite problem undertaken for actual experience on the part of the student.
331. **Economics of Business Enterprise (3:3:0).** Prerequisite: ECO 232. The application of economic theory to problems of business enterprise.
334. **Taxation and Public Expenditures (3:3:0).** Prerequisite: ECO 232. Analysis of economic aspects of government finance; principles and problems of taxation, public expenditures, budgetary controls, and debt management.
336. **The Economics of Regulated Enterprise (3:3:0).** Prerequisite: ECO 232 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.
337. **Economic Systems (3:3:0).** Prerequisite: ECO 232. The control of economic institutions for the welfare of the general community. The main principles of a planned economy and existing economic systems.
338. **Foreign Trade (3:3:0).** Prerequisite: ECO 232. Principles of international trade, balance of payments, trade policies, and agreements.
339. **Latin America and the United States (3:3:0).** Prerequisite: ECO 232. The economics of Latin American countries and their economic relations with the United States.
3311. **National Income Analysis (3:3:0).** Prerequisite: ECO 232. National income concept and measurement and an analysis of the requirements for high level employment; uses of income analysis for business decisions and public policy.
3312. **Economics of Labor (3:3:0).** Prerequisite: ECO 232. The theory of wages, the problems of unemployment, economic insecurity, industrial disputes, industrial accidents, development, and aims of labor unions, and employers' associations.
3313. **Introduction to Quantitative Economics Analysis (3:3:0).** Prerequisite: ECO 232 and MATH 137 or equivalent. Use of the basic concepts and symbolism of mathematics in the presentation of economic theory.
3314. **Intermediate Economic Theory (3:3:0).** Prerequisite: ECO 232. Intermediate price theory and introduction to welfare theory. Includes theory of demand, theory of the firm, and welfare theory.
3315. **Development of the European Economy (3:3:0).** An analysis of technological, institutional, and other historico-economic forces and influences which have contributed to the emergence and development of the European economy.
3316. **Development of the American Economy (3:3:0).** An analysis of the European origins and the American development of the technological, institutional, and other historico-economic forces and influences which have created the economy of the United States.

FOR UNDERGRADUATES AND NONBUSINESS GRADUATES

430. **Development of Economic Doctrines (3:3:0).** Prerequisite: ECO 232. The basis, nature, and effects of economic doctrines from ancient times through the nineteenth century.
431. **Contemporary Economic Doctrines (3:3:0).** Prerequisite: ECO 430 or consent of instructor. The basis, nature, and effects of economic doctrines developed during the twentieth century.
433. **International Economic Relations (3:3:0).** Prerequisite: 12 hours in economics. A critical evaluation of selected international economic problems.
435. **The Economics of Transportation (3:3:0).** Prerequisite: ECO 232. A study of the economics and regulatory problems of the various forms of domestic transportation and the public policy related to each.

437. **Current Economic Problems (3:3:0).** Prerequisite: ECO 232. Fundamental problems of economic life today and proposed solutions. Emphasis on monetary and fiscal problems and policies.
4311. **Advanced Economic Theory (3:3:0).** Prerequisite: ECO 3314. Contemporary economic principles and thought concerning the production and distribution of goods and services.
4312. **Macrodynamic Economics (3:3:0).** Prerequisite: ECO 3311. Historical survey of growth and development theory emphasizing cyclical, static macroeconomic models, formal macrodynamic economic models of growth and development.
4321. **Soviet Economics (3:3:0).** Prerequisite: ECO 232. Soviet Economics. An examination and analysis of the operation of the economic system of the U.S.S.R. with special reference to planning.
4322. **Regional Economics (3:3:0).** Prerequisite: ECO 232. A study on the techniques of economic analysis as applied to economic regions, with emphasis on special problems such as location of industry and regional development.
4323. **Monetary Theory (3:3:0)** Prerequisite: ECO 3314 or 331 and FIN 333 or consent of instructor. An analysis of conceptual and theoretical consideration of the various doctrines of money, interest, and capital.

FOR GRADUATES

531. **Economic Research (3:3:0).** Prerequisite: ECO 232. Directed student research in selected areas, with written reports under the supervision of a qualified instructor.
535. **Seminar in Economic Policy (3:3:0).** Prerequisite: ECO 430. An analysis of major economic goals and policies of government and industry.
536. **Advanced International Economics (3:3:0).** Prerequisite: ECO 338 or consent of instructor. An analysis of basic principles, problems and policies in international economics. Special attention is given to theories and alternative policies for economic development.
537. **Seminar in Public Finance (3:3:0).** Prerequisite: ECO 3314, 3311 or 534, or consent of instructor. Analysis of economic effects of taxation, governmental expenditures, debt management, and budgetary planning and administration.
538. **The Nature, Method, and Scope of Economics (3:3:0).** An analysis of the subject matter of economics and the different approaches in acquiring knowledge in the field. Attention is paid to the relationship between the positive and normative aspects of economics.
539. **Classical Economic Thought (3:3:0).** Prerequisite: ECO 430. A critical analysis of the contributions of the Mercantilists, Monetary Economists, physiocrats and other pre-classical writers of economic thought. An intensive investigation of the body of classical and neo-classical thought as developed by Smith, Malthus, Ricardo, Say, Mill, Marshall and others.
5242. **Managerial Economics (2:2:0).** Prerequisite: ECO 5341 or equivalent. An advanced course in the application of economic theory and analysis to the problems of the firm. Emphasis on mathematical tools of analysis.
5311. **Philosophy and Historiography of Economic History (3:3:0).** An analytical study of the philosophy and historiography of economic history, with emphasis on the interpretation of economic history and the use of the historical method of analyzing economic forces and influences.
5312. **Seminar in Economic History (3:3:0).** An analysis of selected topics from the economic history of the Western World. Each student is required to plan and to execute a research project related to the topic of the seminar.
5321. **Seminar in Mathematical Economics (3:3:0).** Prerequisite: ECO 3313 or equivalent, or consent of instructor. A study of modern mathematical techniques used in the development and verification of economic theory.
5331. **Individual Study in Economics (3:3:0).** Prerequisite: Graduate standing and permission of instructor. Directed reading and research concerning a specific problem or subject field in economics.
5335. **Human Geography (3:3:0).** Enrollment limited to graduate students in elementary education. The geographic environment of mankind and his adjustments to the environment. Attention given to the geographic factor influencing the population: its characteristics, density, distribution, and economic and social activities.
5341. **Price and Income Theory (3:3:0).** Prerequisite: ECO 5531 or 232. Designed for graduate students who need intensive study of intermediate economic price and income theory.
5351. **Advanced Micro-Economic Analysis (3:3:0).** Prerequisite: ECO 3314 or 5341. Economic factors involved in the theory of the firm and determination of price. Special emphasis on the cases of monopoly, monopolistic competition and oligopoly.
5352. **Advanced Macro-Economic Analysis (3:3:0).** Prerequisite: ECO 3311 or 5341. The aggregate approach to the economy and the tools of analysis used for the solving of aggregate problems.
5531. **The Economic Environment (3:3:0).** Prerequisite: Graduate standing. A rigorous study of microeconomic and macroeconomic theory with applications to the major problems of the economy.
631. **Master's Thesis (3).** Enrollment required at least twice.
731. **Research (3).**

Department of Finance

This department supervises the following degree programs: *FINANCE, Bachelor of Business Administration, Master of Business Administration.* The department participates in the program leading to the degree of *Doctor of Business Administration.*

The three optional programs (Banking and Investments, Financial Administration, and Real Estate and Insurance) follow the same curriculum and differ through the selection of electives approved by the chairman of the department. The degree requirements are listed below.

Bachelor of Business Administration—Finance Major.
(Banking and Investments, Financial Administration, and Real Estate and Insurance)

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (32 to 35 semester hours):
 ACCT 332—Analysis of Financial Statements
 or ACCT 334—Intermediate Accounting I
 ECO 331—Economics of Business Enterprise
 FIN 333—Principles of Money, Banking, and Credit
 FIN 335—General Insurance
 FIN 434—Investments
 SECT 327—Report Writing
 Approved electives—15 to 18 semester hours
- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Courses in Finance.

FOR UNDERGRADUATES

231. **Personal Finance (3:3:0).** Introduction to financial problems of the home and of business. Particular emphasis on those elements that should be considered by the individual before investing in real estate, personal property, insurance, or securities.
331. **Corporation Finance (3:3:0).** Prerequisite: 60 semester hours, including ECO 232 and ACCT 235. Fundamental aspects of modern business organization, with attention to financial problems.
333. **Principles of Money, Banking, and Credit (3:3:0).** Prerequisite: ECO 232. A basic course, including consideration of monetary standards, organization and functioning of commercial banking and the Federal Reserve System, problems of money, prices, and credit control. Recent monetary and banking trends are emphasized.
334. **Credits and Collections (3:3:0).** Prerequisite: ACCT 235. Types and analysis of financial statements, credit limits, collection procedures, legal remedies of the creditor, sources of credit information.
335. **General Insurance (3:3:0).** Prerequisite: ECO 231. A survey of the entire field of private insurance and a foundation for more specialized courses.
336. **Life Insurance (3:3:0).** Prerequisite: FIN 335 or approval of instructor. The nature of life insurance; various ways of utilizing the protection it offers. Principal features of life insurance and annuity contracts. Group insurance, industrial insurance, disability protection, insurance company investments, and the taxation of policy proceeds.

FOR UNDERGRADUATES AND NONBUSINESS GRADUATES

431. **The Federal Reserve System (3:3:0).** Prerequisite: FIN 333. Analysis of functions and services of the Federal Reserve System.
432. **Real Estate (3:3:0).** Real estate practice and finance from the standpoint of the broker, businessman, and property owner. Real estate office, organization, leasing and property management, valuation and taxation. Legal, financial, economic, and social aspects of the real estate field.
433. **Corporate Financial Problems and Cases (3:3:0).** Prerequisite: FIN 331. An intensive analysis of selected financial problems concerned with the organization, operation, and dissolution of business organizations; special attention to the corporation.
434. **Investments (3:3:0).** Prerequisite: FIN 331. Various types of investment media; major emphasis on basic principles of investment, construction of an investment portfolio, security analysis, sources of information, and the mechanism for investment.
435. **Property Insurance (3:3:0).** Prerequisite: FIN 335 or approval of instructor. Study of fire insurance, marine insurance, and allied lines.
437. **Casualty Insurance (3:3:0).** Prerequisite: FIN 335 and 435. Various casualty lines of insurance, such as public liability, automobile, workmen's compensation, aviation, burglary and robbery, glass, power plant, and accident and health. Contracts and practices in the field of fidelity and surety bonding. Primarily for those desiring to specialize in insurance.
438. **Bank Administration (3:3:0).** Prerequisite: FIN 333 and 431. Internal operations of a commercial bank; major emphasis on the organization of the bank, sources of bank funds, allocation of bank funds, and supervision and regulation of the commercial bank.
439. **Real Estate Appraisal (3:3:0).** Prerequisite: FIN 432. Application of principles of property valuation to the various classes of realty. Emphasis on the character of land value, axioms of valuation, and application of valuation procedures by use of cost, market, and capitalization of income approach to real estate value.
4311. **Security Analysis (3:3:0).** Prerequisite: FIN 434. Comprehensive studies of the various methods of security selection and portfolio management are included. Intensive emphasis is placed upon valuation procedure of the various security types, particularly common stock.
4312. **International Finance (3:3:0).** Prerequisite: FIN 333 or consent of instructor. A study of the international monetary system in its theoretical and institutional setting. The flows of financial claims between countries both on current and capital account, and the function of the foreign exchange market in arbitrage and hedging. The position of an individual business firm in conducting international trade, the procedures and practices in financing international transactions.

FOR GRADUATES

531. **Current Financial Problems (3:3:0).** Solution and presentation of approved problems involving individual research in the field of finance.
533. **Seminar in Investment Analysis (3:3:0).** Prerequisite: FIN 434 or equivalent. Security analysis and selected problems in individual, and institutional portfolio analysis.
535. **Seminar in Current Banking Problems (3:3:0).** Prerequisite: FIN 438 or equivalent. Major problems affecting commercial banks and the banking system at the present. Representative case problems used as a basis for analysis and decision.
536. **The Money and Capital Markets (3:3:0).** Prerequisite: FIN 431 and 433 or equivalent. A theoretical and empirical examination of saving and investment, financing and financial intermediaries, asset and portfolio structures, and interrelationship of financial and real variables of the economy.
537. **Risk Administration (3:3:0).** Prerequisite: FIN 335 or equivalent. A consideration of various methods of risk treatment including retention, prevention, reduction and transfer.
538. **Seminar in Contemporary Financial Theory (3:3:0).** An analysis of selected topics from various fields of finance. Each student is required to plan and to execute a research project related to the topic of the seminar. Course may be repeated for up to nine hours credit, providing there is no duplication of topics.
539. **History of Financial Thought (3:3:0).** A study of the evolution of thought concerning the finance function.
5331. **Business Finance (3:3:0).** Prerequisite: ACCT 5531 and ECO 5331 or equivalent. An introductory course in finance for graduate students designed to cover concepts in business finance and investment.
5341. **Current Business Financial Practices (3:3:0).** Prerequisite: FIN 331 or 5331. The general theory of financial administration with application to practical problems in business finance.
5351. **Financial Policies of Business (3:3:0).** Prerequisite: FIN 433 or 5341. The financial policy of business organization with emphasis on the organization of the financial function, evaluation of the financial performances and determination of the financial requirements.
731. **Research (3).**

Courses in Business Law.

FOR UNDERGRADUATES

338. **Business Law I (3:3:0).** Prerequisite: 60 semester hours. Nature and source of law, courts and procedure, contracts, Texas law of separate and community property, agency.
339. **Business Law II (3:3:0).** Second course in business law. Law of negotiable instruments, business organizations, including partnerships and corporations sales.
3311. **Real Estate Law (3:3:0).** Rights in land; classification of estates; acquisition and creation of property rights; titles; and common conveyances.
3312. **Insurance Law (3:3:0).** General principles of insurance law; the insurance contract; insurance agents and their powers; rights under fire, life, and accident policies; taxation affecting insurance policies; insurance and community property rights.
3313. **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

FOR GRADUATES AND NONBUSINESS GRADUATES

4311. **CPA Law Review (3:3:0).** Review of business law, with emphasis on subject matter appearing frequently in the CPA law examinations.

FOR GRADUATES

5331. **Legal Environment of Business (3:3:0).** Prerequisite: Graduate standing. The meaning, nature and sources of the law, the factors which shape it, and substantive fields of law which affect business organizations.

Department of Management

This department supervises the following degree programs: **INDUSTRIAL MANAGEMENT, Bachelor of Business Administration**; **MANAGEMENT, Bachelor of Business Administration, Master of Business Administration**. The department participates in the program leading to the degree of *Doctor of Business Administration*.

The four optional programs (Administrative, Office, Personnel, and Traffic Management) follow the same core curriculum and differ through the selection of electives approved by the chairman of the department. The undergraduate degree requirements are given in the tables below.

Bachelor of Business Administration—Industrial Management Major.

- I. Nonprofessional courses (55 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (33 semester hours):
 - ACCT 336—Principles of Cost Accounting
 - ECO 331—Economics of Business Enterprise
 - or ECO 3314—Intermediate Economic Theory
 - IE 3331—Work Analysis and Design I
 - MGT 232—Quantitative Analysis for Management Decisions I
 - MGT 332—Quantitative Analysis for Management Decisions II
 - MGT 336—Behavioral Science in Business and Industry
 - MGT 432—Administrative Policy

MGT 435—Employee Supervision
MGT 438—Production I
MGT 439—Production II
MGT 4331—Collective Bargaining

- IV. Electives to complete a total of 125 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 50 academic hours of course work outside the School of Business Administration.

Bachelor of Business Administration—Management Major.

- I. Nonprofessional courses (49 semester hours).
II. Basic professional courses (31 semester hours).
III. Major professional courses (39 to 42 semester hours):
ACCT 331—Managerial Accounting
or ACCT 334—Intermediate Accounting
MGT 4331—Collective Bargaining
MGT 334—Personnel Administration I
MGT 432—Administrative Policy
MGT 435—Employee Supervision
Additional approved electives—20-27 semester hours.
IV. Electives to complete a total of 125 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 50 academic hours of course work outside the School of Business Administration.

Courses in Management.

FOR UNDERGRADUATES

110. **Professional Careers in Business (1:1:1).** Factors important for career preparation; behavioral factors in successful choice and pursuit of business occupation. Occupation information and preparation for those who aspire to successful careers in the business world.
232. **Quantitative Analysis for Management Decisions I (3:3:0).** Prerequisite: Consent of instructor. Development and understanding of business decision tools and models to be applied to the managerial decision process.
330. **Organization and Management (3:3:0).** The management function; basic principles, concepts, and practices in the operation of the organization.
331. **Industrial Management (3:3:0).** Principles and methods used in developing and operating industrial and business enterprises; principles of scientific management.
332. **Quantitative Analysis for Management Decisions II (3:3:0).** Prerequisite: ACCT 234, 235; ECO 231, 232; MGT 232; MKT 246. The applications of quantitative tools to business problems.
334. **Personnel Administration I (3:3:0).** Prerequisite: Consent of instructor. Principles and methodology in general personnel management and work force maintenance.
335. **Purchasing, Stores, and Inventory Control (3:3:0).** Prerequisite: MGT 331. The organization and function of the procurement and inventory activity.
336. **Behavioral Science in Business and Industry (3:3:0).** Prerequisite: Consent of the instructor. Theory, methods, and demonstrations of behavioral science applied to problems of business, industrial, and engineering settings.
339. **Office Management (3:3:0).** Standards of office practice, office methods, office planning techniques, and duties and responsibilities of the office manager.
3331. **Recent Labor Legislation (3:3:0).** Prerequisite: MGT 331. Study of permissive areas of activity in labor relations, with particular emphasis on major federal laws. General state labor legislation, with emphasis on Texas laws, is included.
3371. **Industrial Traffic Management (3:3:0).** Prerequisite: Consent of the instructor. The problems of commercial and industrial traffic management are studied, as well as logistics, functions.
3381. **The Theory of Transportation Ratemaking (3:3:0).** A study of the rules, rates, and charges governing the movement of goods in common carrier transportation.

FOR UNDERGRADUATES AND NONBUSINESS GRADUATES

430. **Management of Small Business Enterprise (3:3:0).** Prerequisite: Consent of the instructor. A problem course involving the application of principles of management to small-scale enterprise situations.
431. **Job Evaluation and Wage Administration (3:3:0).** Prerequisite: Consent of instructor. Applications of wage theory to wage problems of the firm, investigation of financial incentives, and administration of the wage program.
432. **Administrative Policy (3:3:0).** Prerequisite: Consent of instructor. Application of the case method to complex problems of policy formulation in the administration of the firm.
434. **Personnel Administration II (3:3:0).** Prerequisite: MGT 334. Problems in personnel management examined through consideration of cases, experiences, and results of research in various fields of employer-employee relationships.
435. **Employee Supervision (3:3:0).** Prerequisite: MGT 331. The relation of the supervisor to his subordinates and to higher management, leadership, planning of group work, and the use of the tools of supervision.
436. **Office Systems and Procedures (3:3:0).** Prerequisite: MGT 339 or consent of the instructor. Development and standardization of practices and procedures, work analysis and job simplification, and planning of administrative systems and controls.

438. **Production I (3:3:0).** Prerequisite: MGT 331, 332; MKT 246; and ECO 331, or 3314. Critical examination of management decision-making techniques, with major emphasis on the practical applications of scientific methods to analysis of production activities.
439. **Production II (3:3:0).** Prerequisite: MGT 438. An extension of Production I, with a rigorous application of schematic, statistical, and mathematical tools to problems of systems design and resource allocation within the firm.
442. **Industrial Management Problems (4:3:2).** Prerequisite: MGT 331 or equivalent background. A problem and field course involving study of organization, planning, and operation of industrial enterprises.
4331. **Collective Bargaining (3:3:0).** Prerequisite: MGT 331. A study of labor union development, organization, leadership, and operational techniques. Consideration of collective bargaining issues and procedures.
4371. **Regulation of Transportation (3:3:0).** Prerequisite: MGT 3371. Study of the Interstate Commerce Act, its interpretation, and its applications to the operations of carriers.
4381. **Advanced Traffic Management (3:3:0).** Prerequisite: MGT 3371. Advanced study of the major problems faced by industry and by carriers in the movement of goods.

FOR GRADUATES

511. **Individual Problems (1:1:0).**
530. **Individual Research in Management (3).**
531. **Current Problems in Management (3:3:0).**
533. **Quantitative Analysis for Business (3:3:0).** Prerequisite: Consent of instructor. Quantitative tools and the techniques employed in problem analysis utilizing computer aid for the more complex situations.
535. **Human Behavior in Business (3:3:0).** Prerequisite: Consent of instructor. The course examines theories of social and behavioral sciences and will emphasize research and the analysis of problems involving the role and contributions of people in the business environment.
536. **Management of Human Resources (3:3:0).** Prerequisite: Consent of instructor. Factors involved in the selection, development, adjustment, and motivation of individual employees with emphasis on independent investigations and preparations by students.
537. **Seminar in Personnel Administration (3:3:0).** Prerequisite: Consent of instructor. A reading and research seminar, involving individual research and reflective group discussion emphasizing evaluation of personnel policies and design of model personnel organizations.
538. **Advanced Production Management (3:3:0).** Prerequisite: Consent of instructor. Complex problems encountered in managing production operations. Use of modern analytical techniques such as those of management science, operations research, and simulation.
539. **Seminar in Operations Management (3:3:0).** Prerequisite: Consent of instructor. Readings, individual research and reports, and group studies of operations policy and production problems. Complex problems requiring programming to computers will be included.
5311. **International Business Management (3:3:0).** Prerequisite: Consent of instructor. Comparative analysis of domestic, international, and multi-national business operations, and the significance for organization and management.
5312. **Administrative Policy and Strategy (3:3:0).** Prerequisite: Consent of instructor. An integrative and problem-solving course in organizational administration, planning, and strategy. Simulations and cases are utilized in diagnostic and decision-making exercises.
5313. **Business and Management Systems (3:3:0).** Prerequisite: Consent of instructor. Analysis of a business or enterprise in terms of its major functions in order to build a framework for an information or control system.
5314. **Philosophy and Thought in Management (3:3:0).** Prerequisite: Consent of instructor. An investigation into the forces and institutions which control and influence the exercise of managerial activities. Emphasis on history, ethics, and current thought.
5315. **Mathematical Programming for Business (3:3:0).** Computer based linear programming; revised simplex method; special problem forms and methods; parametric programming; business applications.
5316. **Computer Models for Business, Industry, and Government (3:3:0).** Study, construction, and operation of computer simulations and other models as aids for management and administrative decisions.
5331. **Organization and Human Behavior (3:3:0).** Prerequisite: Consent of instructor. An introduction to the decision-making process and the principles of organization and administration as basic social techniques.
5341. **Management Decision Making (3:3:0).** Prerequisite: Consent of instructor. Limited to other than management majors. A basic management theory course intended to provide students with an orientation to the decision-making function of the manager or administrator.
5342. **Production Management (3:3:0).** Prerequisite: Consent of instructor. Fundamentals of the production function and basic analytical methods of factor allocation.
5351. **Decision Theory and Management Science (3:3:0).** Prerequisite: Consent of instructor. An operative theory of decisions for business, including foundations in philosophy, logic, economics and management science.
5352. **Administrative Organization (3:3:0).** Prerequisite: Consent of instructor. Development of organization theory and applications in the analysis of organization design and the measurement of its effectiveness.
731. **Research (3).**

Department of Marketing

This department supervises the following degree programs: *ADVERTISING, Bachelor of Business Administration; MARKETING, Bachelor of Business Administration, Master of Business Administration; RETAILING, Bachelor of Business Administration.* The department also participates in the program leading to the degree of *Doctor of Business Administration.* The undergraduate degree requirements are given in the tables below.

Bachelor of Business Administration—Advertising Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (29 semester hours):
 - ACCT 331—Managerial Accounting
 - ART 321—Problems in Visual Communications
 - JOUR 3351—Advertising Media
 - MKT 334—Principles of Advertising
 - MKT 335—Principles of Retailing
 - MKT 4311—Advertising Practices
 - MKT 4312—Advertising Campaigns
 - MKT 4316—Advertising Administration
 - MKT 433—Marketing Problems
 - MKT 436—Marketing Research and Analysis
- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Bachelor of Business Administration—Marketing Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (33 semester hours):
 - ACCT 332—Analysis of Financial Statements
or ACCT 336—Principles of Cost Accounting
 - MGT 432—Administrative Policy
 - MKT 334—Principles of Advertising
 - MKT 335—Principles of Retailing
 - MKT 339—Principles of Salesmanship
 - MKT 433—Marketing Problems
 - MKT 434—Wholesaling
 - MKT 435—Business Cycles and Forecasts
 - MKT 436—Marketing Research and Analysis
 - MKT 439—Sales Management
 - PSY 230—General Psychology I
- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Bachelor of Business Administration—Retailing Major.

- I. Nonprofessional courses (49 semester hours).
- II. Basic professional courses (31 semester hours).
- III. Major professional courses (33 semester hours):
 - ACCT 331—Managerial Accounting
 - ECO 331—Economics of Business Enterprise
 - MGT 336—Behavioral Science in Business and Industry
 - MKT 334—Principles of Advertising
 - MKT 335—Principles of Retailing
 - MKT 433—Marketing Problems
 - MKT 436—Marketing Research and Analysis
 - MKT 4315—Retail Buying
 - MKT 4319—Retail Internship
 - PHIL 231—Introduction to Logic
 - PSY 230—General Psychology I
- IV. Electives to complete a total of 126 semester hours, exclusive of freshman and sophomore physical education, band, or basic ROTC. It may be necessary to use a part of these electives to assure a required total of not less than 51 academic hours of course work outside the School of Business Administration.

Courses in Marketing.**FOR UNDERGRADUATES**

246. **Introduction to Business Statistics (4:3:2).** Prerequisite: MATH 137 and 138. Techniques of analysis of numerical data including averages, dispersion, statistical inference, linear correlation, and time series.
331. **Public Relations (3:3:0).** Policies and procedures of creating and maintaining public good will in business. The course examines the many functional aspects of public relations.
332. **Principles of Marketing (3:3:0).** Marketing structures and agencies. Motives and buying habits. Types of middlemen, marketing institutions, and channels. Current marketing practices. Marketing of industrial and consumer goods.
334. **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.
335. **Principles of Retailing (3:3:0).** Prerequisite: MKT 332. Comprehensive introduction to and evaluation of retailing with emphasis on profit elements, pricing and merchandising policies, inventory and merchandise control.
339. **Principles of Salesmanship (3:3:0).** Fundamentals of personal salesmanship applied specifically in the marketing of goods and services and as they may aid any business or professional man.

FOR UNDERGRADUATES AND NONBUSINESS GRADUATES

426. **Index Numbers (2:2:0).** Prerequisite: MKT 246. An intensive study of the construction and interpretation of index numbers. Practical problems in measurement of business status through use of index numbers.
431. **Industrial Marketing (3:3:0).** Prerequisite: MKT 332. Problems involved in marketing industrial goods, including commodities.
433. **Marketing Problems (3:3:0).** Prerequisite: MKT 332 and senior standing. Actual marketing cases and problems. Marketing costs, brand policy, channels of distribution, sales promotion, sales policies, price policies, and operating control.
434. **Wholesaling (3:3:0).** Prerequisite: MKT 332. Processes and institutions of wholesale marketing from manufacturer to retailer through merchant and functional middleman with special emphasis upon modern channels of distribution.
435. **Business Cycles and Forecasts (3:3:0).** Prerequisite: MKT 246. Theories of cycles. Causes and proposed remedies. Examination of forecasting services and techniques employed by them. Problems in specific commodities and securities.
436. **Marketing Research and Analysis (3:3:0).** Prerequisite: MKT 246 and 332. Scientific marketing research methods; emphasis on collection, analysis, and interpretation of data as applied to the solution of marketing problems.
437. **Advanced Business Statistics (3:3:0).** Prerequisite: MKT 246. A more extended study of some phases of business statistics, including multiple and partial correlation, analysis of variance, and chi-square tests.
439. **Sales Management (3:3:0).** Prerequisite: MKT 332. Problems and methods of organization and administration of sales departments, sales operations, sales control, sales promotion, and sales policies.
4311. **Advertising Practices (3:2:3).** Prerequisite: MKT 334 or approval of instructor. Analysis of the creative aspects of advertising: copy, layout, typography, and production. Provides practical application for the different types of media advertising.
4312. **Advertising Campaigns (3:1:4).** Prerequisite: MKT 4311 or approval of instructor. A specialized, skill-development course with emphasis on advertising campaigns. Includes planning, preparing, and presenting of campaigns.
4315. **Retail Buying (3:3:0).** Prerequisite: MKT 335. Analysis of the functions of the retail buyer. Evaluation and direction of buying techniques. Qualitative and quantitative considerations in buying.
4316. **Advertising Administration (3:3:0).** Prerequisite: MKT 4311. Use of the problem-solving approach to management problems in advertising through cases, research projects, special reports, and readings.
4319. **Analysis of Retail Operations (3:1:4).** Prerequisite: Approval of instructor. Study of the functional operations processes in a retailing institution. Student follows a schedule of observation, analysis and application. Minimum of 75 clock hours.

FOR GRADUATES

531. **Advanced Marketing Problems (3:3:0).** Prerequisite: Graduate standing and consent of instructor. Contemporary marketing problems and resultant opportunities. Heavy emphasis on reading from current journals and other related publications.
532. **Advanced Marketing Research (3:3:0).** Prerequisite: Graduate standing and consent of instructor. Experimental design of research projects dealing with marketing problems.
533. **Marketing Theory (3:3:0).** Prerequisite: MKT 332 or 5331, graduate standing, and consent of instructor. Principles, theories, and problems in marketing from the social and the firm's point of view.
536. **Individual Study in Marketing I (3:3:0).** Prerequisite: Graduate standing. Directed individual study of advanced marketing problems varying with the needs of the particular student.
537. **Individual Study in Marketing II (3:3:0).** Prerequisite: Graduate standing. Directed individual study of advanced marketing problems varying with the needs of the particular student.
538. **Trade Regulations (3:3:0).** Prerequisite: Graduate standing. Governmental controls intended to promote the free enterprise system. Federal, state, and local laws and their interpretation by the courts.
5331. **Marketing Foundations (3:3:0).** Prerequisite: Graduate standing. Marketing functions and the institutions which perform them; choice of criteria for marketing strategy decisions; marketing structural relationships; and the role of marketing.
5332. **Statistical Methods in Business (3:3:0).** Prerequisite: Graduate standing. Topics covered include averages, dispersion, estimation, testing hypotheses, correlation, regression, analysis of time series, and applications of these techniques to decision making.
5334. **Advertising in a Contemporary Society (3:3:0).** Prerequisite: Graduate standing and approval of instructor. A broad perspective and penetrating study of advertising—its functions, its role, its challenges, and its opportunities for business and society.

5341. **Marketing Administration (3:3:0)**. Prerequisite: Graduate standing. Marketing planning, strategy, and tactics. Organization, execution, and control of the marketing effort. Enrollment limited to nonmarketing majors.
5342. **Advanced Statistical Methods (3:3:0)**. Prerequisite: MKT 5332 or 246 and graduate standing. A continuation of MKT 5332. Emphasis on evaluation and use of analytical and interpretive statistical methods.
5343. **Seminar in Industrial Marketing (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. Marketing research, channels of distribution, promotional efforts, pricing, and control of marketing operations in industrial markets.
5351. **Marketing Thought (3:3:0)**. Prerequisite: MKT 332 or 5331, graduate standing, and consent of instructor. The contribution of marketing scholars to marketing thought. Development of problems, theory, and principles.
5352. **Statistical Decision Making (3:3:0)**. Prerequisite: MKT 246 or 5332. Bayesian decision analysis, involving probability theory incorporated in scientific business decisions.
5353. **Marketing Strategy I (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. Product development decisions and channel distribution analysis evaluated in detail and related to management decisions.
5354. **Marketing Strategy II (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. Promotional policies and pricing policies evaluated in detail and related to necessary management decisions.
5355. **Seminar in Current Marketing Problems (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. A critical analysis of selected current problems in the field of marketing.
5362. **Advanced Experimental Statistics (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. Business statistical problems involving experimental design and combining the methodology involved in experimentation.
5372. **Advanced Inference Problems (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. Business statistical problems involving inference, including inferences concerning proportions, variances, regression, correlation, and covariance.
5382. **Advanced Multivariate Analysis (3:3:0)**. Prerequisite: Graduate standing and consent of instructor. Business statistical problems involving advanced multivariate techniques including correlation, factor analysis, discriminant analysis, activity analysis, and input-output analysis.
731. **Research (3)**.

School of Education

The School of Education, established in 1967, 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 Technological College holds membership in the American Association of Colleges for Teacher Education. This membership signifies that the teaching certificate earned at Texas Technological College is accepted in a majority of the states in the nation through reciprocity with other members of the association.

The primary function of the School of Education is to provide degree and teacher certification programs for both undergraduate and graduate students who plan a career in teaching in the elementary and secondary schools. In addition the graduate program qualifies persons to serve as general educational administrators, elementary and secondary school principals, supervisors, guidance and counseling specialists, school business specialists, curriculum directors, special education teachers and administrators, and educational research and field services specialists.

The School of Education is divided into instructional departments which offer course work leading to degrees and to teacher certification. Specific curricula are designed for each degree program and are shown in tables on the following pages, together with a descriptive list of courses offered in each department. Any deviation from the approved curriculum for a particular degree must have prior approval from the chairman of the department supervising the program and the office of the Dean of the School of Education.

Advisory Program. The advisory program in the School of Education is designed to provide aid to each student in planning and carrying out the appropriate degree and teaching certification program. Each student, including transfers, who enrolls in the School of Education is assigned to a faculty adviser. Each student is expected to have at least one individual interview each semester with the adviser during which the current semester's work will be evaluated and the next semester's plan will be developed.

The faculty adviser is responsible for (1) assisting the student in planning his program and in selecting courses to be taken each semester prior to registration, (2) advising the student in planning a balanced class schedule, (3) helping the student in selecting the proper areas of specialization and/or teaching fields, (4) advising the student in meeting admission and retention standards of teacher education and student teaching, and (5) serving as a counselor on personal problems upon request. Either adviser or advisee may file a request in the office of the Dean of the School of Education for a change in assignment.

Degree and Teaching Certification Programs. The School of Education offers work at the undergraduate level leading to the degree of Bachelor of Science in Education with a major in elementary education or secondary education. These programs are designed especially for those who plan a career in teaching in the elementary and secondary schools in any area of specialization and/or teaching fields. In accordance with the choice of the individual student, his degree program will satisfy the legal requirements of Texas for a teaching certificate at the appropriate grade level and in the desired teaching fields. Since the Bachelor of Science in Education degree includes the requirements for certification to teach, these must be completed before the degree can be awarded.

Students previously enrolled in a program leading to a Bachelor of Science in Education degree (elementary or secondary) in the School of Arts

and Sciences may complete the program as specified in the catalog under which they entered.

All persons recommended for or applying for the Provisional Teaching Certificate will be required to take the National Teacher Examinations during the last semester of their college program. Evidence of having taken the National Teacher Examinations must be submitted prior to the issuance of the certificate.

The School of Education offers work at the graduate level leading to the Master of Education degree, Doctor of Education degree, and the Professional Teaching Certificate. These programs are described in the *Catalog of the Graduate School*.

Academic Foundations. During the freshman and sophomore years the student completes the academic foundations for both the Bachelor of Science in Education degree and the requirements for a teaching certificate. The work in professional education and the advanced courses in the teaching specialization for elementary and the two teaching fields or broad fields major for secondary are taken in the junior and senior years.

The academic foundations program in the elementary education curriculum is shown in the freshman and sophomore years in the accompanying table. Students preparing to teach in the elementary school are advised to follow the sequence shown. The academic foundations program in the secondary education curriculum is shown in the freshman and sophomore years in the secondary education table. Students preparing to teach in the secondary school are advised to follow the sequence shown. Students who postpone taking the required freshman courses until the senior year will take such subjects, but credit will not be allowed towards the degree.

Academic Specialization (Elementary Level) and Teaching Fields (Secondary Level). The student pursuing the Bachelor of Science in Education degree with a major in elementary education may begin his academic specialization in the freshman year. The student seeking the Bachelor of Science in Education degree in the secondary curriculum may begin work in the teaching field(s) during the freshman year. A majority of the work in the academic specialization (elementary) and the teaching fields (secondary) must be completed prior to admission into student teaching. Therefore, the student is advised to follow the specialization sequence shown in the table for the appropriate degree.

Professional Education. The professional education sequence for both the elementary and secondary curricula begins the first semester of the junior year. Since the student must complete 12 semester hours in professional education before admission into student teaching in the elementary curriculum and 9 semester hours in the secondary curriculum, it is essential that the exact sequence for professional education shown in the appropriate degree table be followed. Failure to do so may preclude completion of the degree and certification program in four years. No student will be permitted to enroll in more than 9 semester hours of professional education in one semester.

Student Load. The normal load for a student in the School 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 Dean of the School of Education. During the semester in which student teaching is taken the maximum load is 16 semester hours.

Length of Degree Program. The Bachelor of Science degree in both elementary and secondary education can be completed within normal load limits in eight semesters. A student may, however, be required to attend either one summer term or a ninth semester due to failure to meet the admission standards into teacher education and student teaching, poor planning or scheduling, or for other reasons. During the first semester of the junior year the student, with the aid of the faculty adviser, should plan the remaining degree requirements to determine his graduation date. An application for the degree should be filed in the office of the Dean of the School of Education before his last semester.

Bachelor of Science in Education—Elementary Major. The curriculum established for elementary education is designed to provide (1) a broad base in academic foundations essential to teaching effectively in the

elementary schools; (2) a specialization in one subject field; (3) an emphasis in art, health and physical education, and music; (4) an intensive preparation in professional education, including student teaching, and in elementary content courses; (5) electives chosen under advisement to round out the personal and professional development of the individual. A detailed curriculum table is given with the Department of Elementary Education. The general requirements are listed below:

	Sem. Hrs.
1. English	12
2. Mathematics	3
3. Government	6
4. American History	6
5. Laboratory Science	16
Including biology and two semesters of physical science.	
6. Anthropology, Economics, Philosophy, Speech, Sociology	15
7. Music, Health and Physical Education	12-18
8. Academic Specialization (Plan I, Plan II)	18-24
May duplicate courses in 1-7 above. Plan I must include 9 hours of advanced work and Plan II must include 12 hours of advanced work.	
9. Professional education and elementary content	30
Both the requirements for the degree and the certificate must be completed at the time of graduation.	
10. Physical Education, Band, or Basic ROTC	4-6
11. Electives sufficient with the above to total a minimum of 124 semester hours, not including physical education, band, or basic ROTC	

Bachelor of Science in Education—Secondary Major. The curriculum established for secondary education is designed to provide (1) a broad base in academic foundations believed to be essential for effective teaching in the secondary schools in any subject or field; (2) a specialization in two teaching fields, or in a broad teaching field; (3) an intensive preparation in professional education including student teaching; (4) electives to round out the personal and professional development of the individual.

In this program the student may begin work in one of the major teaching fields in the freshman year. This work will be done in departments outside the School of Education offering the teaching fields listed in the section of this catalog entitled Teacher Education. A detailed curriculum table is presented with the Department of Secondary Education. The general requirements are listed below:

	Sem. Hrs.
1. English	12
2. Mathematics or Foreign Language	6-8
3. Government	6
4. American History	6
5. Laboratory Science	8
6. Philosophy, Sociology, Speech	9
7. General Psychology, Physical Education, or fine arts	3
8. Adolescent Psychology	3
9. Teaching field No. 1	24
May duplicate courses in 1-7 above.	
10. Teaching field No. 2	24
May duplicate courses in 1-7 above.	
11. Professional education	24
Only 18 hours required for certificate; for degree purposes 6 hours of electives from professional education must be chosen under advisement. Both the requirements for the degree and certificate must be completed at the time of graduation.	
12. Physical Education, Band, or Basic ROTC	4-6
13. Electives sufficient to total a minimum of 124 hours not including physical education, band, or basic ROTC	

Department of Education

This department cooperates in the degree programs in EDUCATION leading to the degrees of *Bachelor of Science in Education*, *Master of Education*, *Doctor of Education* and supervises work for the Professional Certificates.

Courses in Education.

FOR UNDERGRADUATES

332. **Educational Psychology (3:3:0).** Prerequisite: Junior classification. Eligibility for or admission to the Teacher Education Program. Educational and psychological principles as basic knowledge in professional education and in teaching.
4315. **Audio-Visual Education (3:3:1).** Prerequisite: 9 hours of education. A general course with emphasis on operation and care of equipment; methods and techniques in using communicative materials in teaching-learning. \$3 service fee. Lab one hour per week required.

FOR UNDERGRADUATES AND GRADUATES

430. **History and Philosophy of Education (3:3:0).** Prerequisite: Senior classification and 9 hours of education. Influences of historical developments and philosophical concepts upon education as the foundation of our American democracy.
438. **Educational Measurement and Evaluation (3:3:0).** Prerequisite: Senior classification and 9 hours of education. A foundation course in problems of measurement and evaluation by the classroom teacher in the public schools.
4331. **Foundations of Educational Sociology (3:3:0).** Prerequisite: Senior classification and 9 hours of education. Principles of education sociology essential to an understanding of the social, economic, civic, and cultural functions of education.

FOR GRADUATES

530. **Advanced Educational Psychology (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Emphasis on the application of educational psychological principles to teaching at all levels.
532. **Philosophy of Education (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Major social philosophies and their application to the field of education in the United States.
533. **General Public School Administration (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Principles and problems involved in the organization and administration of the public schools.
534. **Advanced Educational Sociology (3:3:0).** Prerequisite: 18 hours of education, including 3 hours of educational sociology. Sociological principles as basic knowledge in professional education.
536. **Elementary School Administration (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Elementary school organization, personnel, curriculum, details of modern administration and supervision.
537. **Secondary School Administration (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Curriculum function of administration, developing the master schedule, personnel guidance, finance, and related aspects of organization.
538. **Administration of Audio-Visual Services (3:3:0).** Prerequisite: 18 hours of education, including ED 4315 or 5311 or equivalent. State, regional, and local audio-visual programs; budgeting, selection, procurement, accounting, distribution, and care of audio-visual materials, preparation of personnel for audio-visual centers.
539. **Administration of School Business Services (3:3:0).** Prerequisite: 18 hours of education and educational psychology, including ED 533. Internal business management of schools, including activity funds, teacher welfare, special services, lunchroom, transportation, and purchasing and accounting.
5139. **Advanced Education Workshops in Teaching and Administration (1).** Prerequisite: 18 hours of education and educational psychology, and experience as a teacher or administrator.
5311. **Audio-Visual Education (3:3:1).** A general course with emphasis on methods and materials of educational technology. Laboratory, one hour per week, required. Not acceptable for credit in addition to ED 4315. \$3 service fee.
5312. **Supervision in the Elementary School (3:3:0).** Prerequisite: 18 hours of education and educational psychology including ED 5371. Supervision in the elementary school with emphasis on problems and procedures.
5313. **Supervision in the Secondary School (3:3:0).** Prerequisite: 18 hours of education and educational psychology including ED 5371. Problems and procedures of supervision in the secondary school.
5318. **Selection and Evaluation of Audio-Visual Materials (3:3:0).** Prerequisite: 18 hours in education, including ED 4315 or 5311 or equivalent. Commercially prepared audio-visual materials. Special emphasis given to selection, classification of film and filmstrip, preparation of study guides.
5319. **Audio-Visual Production (3:3:0).** Prerequisite: 18 hours of education, including ED 4315 or 5311 or equivalent. Production, application, and integration of photographic, graphic, three-dimensional, and recorded materials in school programs.
5321. **Individual Study in Education (3:3:0).** Prerequisite: Advanced graduate classification in education and educational psychology. Individual study on special aspects of professional education. May be repeated once for credit.
5322. **Foundations of Educational Research (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Methods of educational research; methods of obtaining, processing, interpreting, and utilizing significant educational data.
5323. **Advanced Educational Statistics (3:3:0).** Prerequisite: 3 hours of educational statistics. Application of statistical analysis to educational data.
5325. **Legal Bases of Education (3:3:0).** Prerequisite: 18 hours of education and educational psychology, and ED 533. Legal structure of education in America, with emphasis on school laws in Texas.
5331. **Human Development in Education (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Biological, social, and psychological interrelationships and implications for classroom teaching and learning.
5346. **Advanced Curriculum Development (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Fundamental bases for curriculum development.
5349. **Organizing and Administering the Instructional Improvement Program (3:3:0).** Prerequisite: 18 hours of education and educational psychology, and ED 5346, or equivalent. Principles and procedures of organizing programs of system-wide curriculum and instructional improvement.

5351. **General Education Seminar (3:3:0).** Prerequisite: 24 hours of education, and approval of admissions committee of the Department of Education. Survey of the field of professional education. Required on the advanced graduate program in education.
5353. **Comparative Education (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Educational systems of the major countries.
5354. **Seminar in Education Sociology (3:3:0).** Prerequisite: 24 hours of education and educational psychology. Educational sociology; current sociological problems as related to the field of professional education.
5357. **The Administration of the Junior College (3:3:0).** Prerequisite: 18 hours of education and educational psychology, including, including 3 hours in educational administration or supervision. Major principles, organizations, problems, techniques, and trends in the administration of the junior college.
5359. **Seminar in Supervision (3:3:0).** Prerequisite: 24 hours of education, including ED 5312 and 5313. Principles and current practices in the field of supervision.
5363. **Problems in Audio-Visual Education (3:3:0).** Prerequisite: 24 hours of education, including ED 4315 and two advanced courses in audio-visual education. Problems in planning audio-visual education programs for school systems and intermediate service agencies; research in the field of audio-visual education.
5364. **Seminar in Education Psychology (3:3:0).** Prerequisite: Graduate classification, 24 hours of education, including advanced educational psychology. Research analysis, and synthesis in the field of educational psychology.
5366. **The Administration of School Staff Personnel (3:3:0).** Prerequisite: 18 hours of education, including ED 533. Principles and procedures in selection, organization, and administration of school personnel.
5367. **School Finance (3:3:0).** Prerequisite: 18 hours of education and educational psychology, including ED 533, 539, or equivalent. Basic theories, principles, and problems in school finance.
5368. **School Housing (3:3:0).** Prerequisite: Limited to majors in educational administration, completion of 15 hours of advanced education, including ED 533, 536, and 537. School building needs; educational and architectural services; evaluation of school facilities; school building master plan; the financial plan; contracting and construction; utilization; operation and maintenance.
5369. **School Public Relations (3:3:0).** Prerequisite: 18 hours of education, including ED 533. Cooperative development of school-community relationship and mutual understanding of the school's purposes, functions, achievements, and needs.
5371. **General Supervision (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Principles, planning, organizations, and processes of supervision in both elementary and secondary schools.
5372. **Organization and Administration of Guidance and Personnel Services (3:3:0).** Prerequisite: 12 hours of education and educational psychology. Designed to acquaint the classroom teacher, principal, and counselor with the understanding and knowledge needed in organizing a school guidance program.
5373. **Educational Evaluation (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Bases and techniques of appraisal, tests, polls, measurement, data treatment, and interpretation.
5381. **Introduction to Guidance and Personnel Services (3:3:0).** Prerequisite: Graduate standing in education. Objectives, principles, and practices in guidance and personnel services in educational settings; the role and scope of activities within the personnel services.
5382. **Guidance and the Classroom Teacher (3:3:0).** Prerequisite: Graduate standing and 18 hours of education. Philosophy and principles of guidance emphasizing the role of the teacher.
5383. **Information Services in Guidance (3:3:0).** Prerequisite: ED 5372 or 5382 or equivalent. Development of informational materials, organization of informational services, and application of educational, personal-social, and vocational information to individual and group activities.
5384. **Group Techniques in Guidance (3:3:0).** Prerequisite: ED 5372 or 5382 or equivalent. A study of group techniques applicable to guidance and personnel services for teachers, supervisors, and administrators, as well as guidance workers.
5385. **Guidance and Counseling in the Elementary School (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Philosophy, principles, and practice of guidance services in elementary schools.
5386. **Guidance Services for Exceptional Children and Youth (3:3:0).** Prerequisite: Graduate standing in education. Provision of guidance and counseling services for students in school and agency programs for exceptional children. Identification and placement procedures.
5387. **Individual Appraisal in Guidance and Counseling Services (3:3:0).** Prerequisite: 9 hours of graduate guidance and counseling courses. Analysis and techniques of individual appraisal in guidance and counseling services.
5389. **Student Personnel Services in Higher Education (3:3:0).** Prerequisite: Graduate standing. An overview of student personnel programs and services in junior colleges, colleges, and universities. A study of the philosophy, role, problems, trends, organization, and administration of student personnel services in higher education.
5390. **Practicum in Guidance (3:3:0).**
5393. **Seminar in Guidance and Counseling (3:3:0).**
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required at least twice.
635. **Internship in Education (3).**
636. **Internship in Education (3).**
- 731, 732. **Research (3 each).**
831. **Doctor's Dissertation (3).** Enrollment required at least four times.

Department of Elementary Education

This department supervises the degree program in **ELEMENTARY EDUCATION** leading to the degrees of *Bachelor of Arts* and *Bachelor of Science in Education* and cooperates in the degree program in **EDUCATION** leading to the degrees of

Master of Education and Doctor of Education. In addition, the department supervises the teacher certification program leading to the Provisional Certificate (elementary) and the Professional Certificate (elementary). The Bachelor of Science degree requirements appear in the accompanying table; the Bachelor of Arts requirements are given in the Arts and Sciences section of this catalog and include a minimum of 30 semester hours in education courses approved by the chairman of this department.

Elementary Education Curriculum.

Students preparing to teach in the elementary school are advised to follow the four-year sequence outlined below.

FIRST YEAR

Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
BIOL 141, Botany or		BIOL 141, Botany or	
BIOL 142, Zoology	4	BIOL 142, Zoology	4
MATH 135, Fund. of Math. I or		HIST 232, Hist. of U.S. since 1877	3
SOC 230, Intro. to Soc.	3	MATH 135, Fund. of Math. I or	
HIST 231, Hist. of U.S. to 1877	3	SOC 230, Intro. to Soc.	3
*Academic specialization or		*Academic specialization or	
P E 233, P.E. for El. Schl. Tchrs.	3	P E 233, P.E. for El. Schl. Tchrs.	3
P.E., Band, or Basic ROTC	1	P.E., Band, or Basic ROTC	1
	17		17

SECOND YEAR

Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
CHEM 141, Gen. Chem. or		CHEM 142, Gen. Chem. or	
GEOL 143, Physical Geol. or		GEOL 144, Physical Geol. or	
PHYS 141, Gen. Phys.	4	PHYS 142, Gen. Phys.	4
*M ED 231, Mus. for		*M ED 232, Ed. Mus. Prac.	
Class, Tchrs. and/or	3	Prin. and/or	3
*Academic specialization or		*Academic specialization or	
SPCH 239, Spch. for Pers. Devel.	3	SPCH 239, Spch. for Pers. Devel.	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		17-18

THIRD YEAR

Fall		Spring	
ED 332, Ed. Psych.	3	E ED 3344, Lang. Arts in	
E ED 3331, Child Dev. &		El. Schl. Curric.	3
El. Schl. Curric.	3	E ED 3345, Soc. Stud. in	
*Academic specialization or		El. Schl. Curric.	3
ANTH 232, Cult. Anthropology	3	*Academic specialization or	
P E 230, P.E. for El. & Sec. Schls.	3	ANTH 232, Cult. Anthropology	3
ART 3317, Art in El. Education	3	*ART 3318, Crafts in El. Ed. and/or	3
	15	*Academic specialization	3
			15

FOURTH YEAR

Fall		Spring	
E ED 461, Stud. Tchg. in El.		E ED 4344, Children's Lit.	3
Schl. (fall or spring)	6	E ED 4341, Tchg. Arth. in El. Schl.	3
E ED 4342, Tchg. Reading in El. Schl.	3	E ED 4343, Tchg. Sci. in El. Schl.	3
*Academic specialization	3	*Academic specialization	3
ECO 237, Eco. Geography or		PHIL 230, Intro. to Phil. or	
PHIL 230, Intro. to Phil.	3	ECO 237, Eco. Geography	3
	15		15

Students are required to take the National Teachers' Examination in order to qualify for a teaching certificate.

* See areas of academic specialization.

** Depends upon which plan of academic specialization is followed.

Courses in Elementary Education.

FOR UNDERGRADUATES

3331. **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. Observation required.
3332. **Kindergarten Education (3:3:0).** Prerequisite: Junior standing; enrollment in or completion of E ED 3331 or equivalent. Bases for programs, methods, and materials for the five-year-old.
3344. **Language Arts in the Elementary School Curriculum (3:3:0).** Prerequisite: Junior standing; enrollment in or completion of E ED 3331, or equivalent. Bases for programs, methods, and materials.
3345. **Social Studies in the Elementary Curriculum (3:3:0).** Prerequisite: Junior standing; enrollment in or completion of E ED 3331, or equivalent. Bases for programs, methods, and materials.

431. **Student Observation and Teaching in the Elementary School (3).** Prerequisite: Attainment of admission standards to student teaching; completion of 90 hours of work, ED 332, E ED 3331, 3345, plus 24 hours in content.
461. **Student Teaching in the Elementary School (6).** Prerequisite: Attainment of admission standards to student teaching; completion of approximately 90 hours of work, ED 332, E ED 3331, 3344, 3345, plus 24 hours in the academic specialization courses.
4341. **Teaching Arithmetic in the Elementary School (3:3:0).** Prerequisite: ED 332 and E ED 3331, or equivalents. Bases for programs, methods, and materials.
4342. **Teaching Reading in the Elementary School (3:3:0).** Prerequisite: Senior standing; ED 332 and E ED 3331, or equivalents; enrollment in, or completion of, E ED 461. Bases for programs, methods, and materials.
4343. **Teaching Science in the Elementary School (3:3:0).** Prerequisite: ED 332 and E ED 3331, or equivalents. Bases for programs, methods, and materials.

FOR UNDERGRADUATES AND GRADUATES

4344. **Children's Literature (3:3:0).** Prose and poetry for children under 12, including standards for judging and criteria for selecting children's books.

FOR GRADUATES

5138. **Advanced Education Workshops in Elementary Education (1:1:0).** Prerequisite: 18 hours of education and educational psychology and experience as a teacher.
5326. **Reading Development in the Elementary School (3:3:0).** Prerequisite: Graduate standing in education. Nature of the reading process; methods and materials for developing this process.
5341. **Developing Arithmetic Programs in Elementary Education. (3:3:0).** Prerequisite: 18 hours of education and educational psychology. The development of arithmetic and its educative function in the elementary school curriculum.
5342. **Developing Reading Programs in Elementary Education (3:3:0).** Prerequisite: 18 hours of education and educational psychology and a course in the teaching of reading. Psychological and research bases for developing reading programs in the elementary school.
5343. **Developing Natural and Physical Environment Concepts in Elementary Education (3:3:0).** Prerequisite: 18 hours of education and 6 hours of science. Methods and materials for helping children develop an understanding of their natural and physical environment.
5344. **Developing Language Arts Programs in Elementary Education (3:3:0).** Prerequisite: 12 hours of English and 18 hours of education. Applications of research findings and modern theory to teaching and organizing the language arts in the elementary school.
5345. **Developing Social Studies Programs in Elementary Education (3:3:0).** Prerequisite: 18 hours of education. Objective, patterns, and principles of organization of social studies in the elementary schools.
5348. **Children's Literature for Elementary School Teachers and Librarians (3:3:0).** Prerequisite: 18 hours of education and educational psychology. Literature for children in the elementary school; selection, use, and organization.
5355. **Seminar in Elementary Education (3:3:0).** Prerequisite: Graduate standing, 24 hours of education and educational psychology, and consent of advisory committee. Trends in modern elementary education.

Department of Secondary Education

This department supervises the degree program in SECONDARY EDUCATION leading to the degrees of *Bachelor of Arts* and *Bachelor of Science in Education* and cooperates in the degree program in EDUCATION leading to the degrees of *Master of Education* and *Doctor of Education*. In addition the department supervises work for the Provisional Certificate (secondary) and the Professional Certificate (secondary). The Bachelor of Science requirements appear in the accompanying table; the Bachelor of Arts requirements are given in the Arts and Sciences section of this catalog and include a minimum of 30 semester hours in education courses approved by the chairman of this department. A minor in education may be included as part of the requirements for a Bachelor of Arts degree.

Secondary Education Curriculum.

Students preparing to teach in the secondary school are advised to follow the four-year schedule outlined in the following. Special attention should be given to the selection of teaching fields, since completion of most of the work in these fields is required as a prerequisite to student teaching.

FIRST YEAR

Fall		Spring	
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
MATH 135, Fund. of Math. I or		HIST 232, Hist. of U.S. since 1877 or	
MATH 133, Coll. Alg. or		GOVT 232, Amer. Govt., Funct.	3
Foreign Language	3-4	MATH 131, Trig.	
HIST 231, Hist. of U.S. to 1877 or		MATH 136, Fund. of Math. II or	
GOVT 231, Amer. Govt., Org.	3	Foreign Language	3-4
Teaching field or elective	3-4	Teaching field or elective	3-4
PSY 238, Gen. Psych. or		SOC 230, Intro. to Soc.	3
*PE 230, Health Ed. in		P.E., Band, or Basic ROTC	1
Ed. & Sec. Schls. or Fine Arts	3		
P.E., Band, or Basic ROTC	1		

SECOND YEAR

Fall		Spring	
ENG 231, Mast. of Lit.	3	ENG 232, Mast. of Lit.	3
**SPCH 239, Spch. Devel. or		Science—Biol., Chem., Geol., or Phys.	4
**PHIL 230, Intro. to Phil.	3	HIST 232, Hist. of U.S. since 1877 or	
Science—Biol., Chem., Geol., or Phys.	4	GOVT 232, Amer. Govt., Funct.	3
HIST 231, Hist. of U.S. to 1877 or		Teaching field	3
GOVT 231, Amer. Govt., Org.	3	**PHIL 230, Intro. to Phil. or	
Teaching field	3	**SPCH 239, Spch. Devel.	3
P.E., Band, or Basic ROTC	1-2	P.E., Band, or Basic ROTC	1-2
	17-18		17-18

THIRD YEAR

Fall		Spring	
S ED 330, Found. of Sec. Ed.	3	PSY 335, Adol. Psych.	3
ED 332, Ed. Psych.	3	S ED 334, Curric. Devel. in Sec. Ed.	3
Teaching field	6	Teaching field	6
Teaching field	3-6	Teaching field	3-6
	15-18		15-18

FOURTH YEAR

Fall		Spring	
S ED 436, Tchg. in Sec. Schis.	3	Teaching field	3-6
S ED 462, Stud. Tchg. in Sec.		Ed. electives—ED 430, 438,	
Schl. (fall or spring)	6	4331, or S ED 4315	6
Teaching field	3	Free electives	6
Teaching field	3		15-18
	15		

Students are required to take the National Teachers' Examination in order to qualify for a teaching certificate.

- * Only one required—if P E 230 is chosen, should be scheduled at later time.
- ** Students should take SPCH 239 one semester of sophomore year and PHIL 230 the other semester.

Courses in Secondary Education.

FOR UNDERGRADUATES

330. **Foundations of Secondary Education (3:3:0).** Prerequisite: Junior classification. Eligibility for or admission to the Teacher Education Program. Introduction to secondary education; basic principles underlying the secondary school program.
334. **Curriculum Development in Secondary Education (3:3:0).** Prerequisite: Junior classification, ED 332 and S ED 330 or equivalent. Foundations of curriculum development, patterns of organization, curriculum resource units, and issues in curriculum development. Observation required.
335. **Teaching Grammar, Composition, Spelling, and Listening (3:3:0).** Prerequisite: 6 hours of education. Preparation for teaching grammar, usage, punctuation, composition, spelling, critical thinking, and listening in junior and senior high schools.
432. **Student Observation and Teaching in the Secondary School (3).** Prerequisite: Attainment of admission standards to student teaching; completion of 90 hours of work, 15 hours of education, including ED 332, and S ED 334, plus a major portion of the course work in the teaching field.
436. **Teaching in Secondary Schools (3:3:0).** Prerequisite: Senior classification; ED 332, S ED 330, 334, or equivalents. Foundations of teaching, methods and techniques, evaluation, management problems related to teaching.
462. **Student Teaching in the Secondary School (6).** Prerequisite: Attainment of admission standards to student teaching; completion of 90 hours of work, 9 hours of education, including ED 332, S ED 330, 334, plus 18 hours of the course work in each of the teaching fields, or 30-36 hours on the 48-hour program. Completion of or enrollment in S ED 436.

FOR UNDERGRADUATES AND GRADUATES

4332. **Developmental and Advanced Reading (3:3:0).** Prerequisite: S ED 330 and ED 332 or a course in reading. Study of reading ability expectancies for grade and age levels; plans for regular and advanced students; study skills, critical reading, motivation, and appreciations.
4333. **Remedial and Corrective Reading (3:3:0).** Prerequisite: S ED 330 and ED 332 or a course in reading. Diagnosis of reading difficulties; organization of reading laboratory; problems of grouping, and evaluation. Selection of equipment, resources, and media.
4334. **Youth Literature for Secondary School Teachers and Librarians (3:3:0).** Prerequisite: 6 hours of education. Selection of materials, media, resources, and equipment for various students in the secondary school.
4336. **Teaching English to the Culturally Disadvantaged (3:3:0).** Prerequisite: 6 hours of education. Presenting the English language and literature to culturally disadvantaged students; methods, materials, curriculum.
4337. **Teaching English Language and Literature to the Bi-Lingual Adolescent (3:3:0).** Prerequisite: 6 hours of education. Problems in teaching English and literature to bi-lingual adolescents. Analysis of language differences as a basis for instruction.

FOR GRADUATES

5137. **Advanced Education Workshops in Secondary Education (1:1:0).** Prerequisite: 18 hours of education and educational psychology and experience as a teacher or administrator.
5136. **The Junior College (3:3:0).** Prerequisite: 18 hours of education and educational psychology. The junior college in terms of terminal education and senior college preparation. Development of junior college programs.

5317. **The Junior High School (3:3:0).** Prerequisite: 18 hours of education and educational psychology. The philosophy, organization, program, special problems, and emerging role of the junior high school.
5332. **Studies in Curriculum of English and Social Studies in Secondary Schools (3:3:0).** Prerequisite: Graduate standing. Scope and sequence of curricula in the fields of social studies and English. Surveys of recent trends; selection of activities, resources, materials, and media.
5334. **Teaching Reading in the Secondary School (3:3:0).** Prerequisite: 12 hours of education and educational psychology. Emphasis on developing reading skills in content fields, establishing a comprehensive reading program.
5356. **Seminar in Secondary Education (3:3:0).** Prerequisite: 24 hours of education and educational psychology. Trends in modern secondary education.

Department of Special Education

This department cooperates in the degree program in EDUCATION leading to the degrees of *Bachelor of Science in Education* and *Master of Education* and supervises work for the Provisional Certificate (Special Education).

Courses in Special Education.

FOR UNDERGRADUATES AND GRADUATES

4212. **The Language of Signs and Fingerspelling (2:2:0).** Prerequisite: SPED 4356. Communication through the language of signs, expressed by the position and motion of arms and hands, and fingerspelling, using manual alphabet.
4338. **The Education of Exceptional Children (3:3:0).** Prerequisite: ED 332. Characteristics of major categories of exceptional children and educational implications.
4339. **Teaching the Educable Mentally Retarded (3:3:0).** Prerequisite: SPED 4338, 4354. Curriculum, methods, and materials in teaching educable level mentally retarded children.
4351. **The Physically Handicapped Child: His Nature and Needs (3:3:0).** Prerequisite: SPED 4338. Physical, psychological, sociological, and educational implications of crippling conditions and chronic health problems in children.
4352. **Teaching the Child with Minimal Brain Dysfunction (3:3:0).** Prerequisite: SPED 4338. The characteristics, psychology, and education of children with brain damage, including the minimally brain injured.
4353. **Teaching the Physically Handicapped Child (3:3:0).** Prerequisite: SPED 4338. The characteristics, psychology, and education of children with orthopedic impairment or chronic health problems.
4354. **Education of the Mentally Retarded Child (3:3:0).** Prerequisite: SPED 4338. Physical, sociological, and psychological and educational implications of mental retardation.
4355. **Teaching the Gifted Child (3:3:0).** Prerequisite: SPED 4338. Characteristics of and educational programming for gifted children.
4356. **Education of the Deaf (3:3:0).** Prerequisite: SPED 4338. The deaf in historical perspective; psychological, sociological, educational implications of severe hearing loss.
4357. **Teaching Elementary School Subjects to the Deaf (3:3:0).** Prerequisite: 9 hours of content courses for the elementary school and SPED 4338 and 4356. Principles and methods of teaching reading, arithmetic, social studies, and science to deaf children.
4358. **Teaching School Subjects to the Deaf II (3:3:0).** Prerequisite: SPED 4357. The second course in the required sequence for certification in deaf education.
4360. **Teaching the Trainable Mentally Retarded (3:3:0).** Prerequisite: SPED 4338 or 4354. Curriculum, methods, and materials in teaching the trainable level mentally retarded.
4361. **The Child with Minimal Brain Dysfunction: His Nature and Needs (3:3:0).** Prerequisite: SPED 4338 or 5390. Introduction to the child with minimal brain dysfunction and learning difficulties; definition, identification, diagnosis, and implications for educational programming.
4658. **Practicum in Special Education (6:6:0).** Prerequisite: Completion of sequence of courses in the particular area of exceptionality. Observation and supervised teaching with the deaf, emotionally disturbed, mentally retarded, physically handicapped, or children with minimal brain dysfunction.
4659. **Internship in Speech Pathology (6:6:0).** Prerequisite: Completion of required courses in speech pathology prerequisite to clinical practice and those required in Professional Development in Education.

FOR GRADUATES

5136. **Advanced Education Workshops in Special Education (1:1:0).** Prerequisite: 18 hours of education and educational psychology and experience as a teacher or administrator.
5374. **Teaching the Emotionally Disturbed Child (3:3:0).** Prerequisite: SPED 4338 or graduate standing. The characteristics, psychology, and education of emotionally disturbed children.
5375. **Educational Appraisal of Exceptional Children (3:3:0).** Prerequisite: SPED 4338. Appraisal instruments and techniques employed by relevant disciplines in determining appropriate educational placement and programming for exceptional children.
5376. **Administration and Supervision of Special Education (3:3:0).** Prerequisite: Graduate standing. Philosophy, concepts, and problems in the administration and supervision of special education programs.
5377. **Seminar in Special Education (3:3:0).** Prerequisite: Graduate standing. Recent research practices and problem areas in special education.
5378. **Problems in Mental Retardation (3:3:0).** Prerequisite: Graduate standing. General problems and problem areas in mental retardation.
5386. **Vocational Adjustment of Mentally Retarded Youth (3:3:0).** Prerequisite: SPED 4338, 4354. Programming for high school retarded to expedite social and occupational adequacy. Contributions of special education and vocational rehabilitation services.
5387. **Reading for the Mentally Retarded (3:3:0).** Prerequisite: Graduate standing. The relationship of the learning characteristics of retarded children to acquisition of reading skills; research in reading for these children; evaluation of existing materials and technology.

5388. **Advanced Curriculum Development for the Mentally Retarded (3:3:0).** Prerequisite: SPED 4339 or graduate standing. Examination of curricular theory, curricular approaches to subject matter, and development of an appropriate curriculum for retarded children at all levels.
5390. **Exceptional Children and Youth (3:3:0).** Prerequisite: Graduate standing. Major categories of exceptional children and youth, psychological, sociological, and educational implications of exceptionality.
5391. **Use of Consultative Techniques for Parents of Exceptional Children (3:3:0).** Prerequisite: SPED 4338 or graduate standing. The roles of professional personnel in bringing about parental understanding of their exceptional children and acceptance of special education placement.
5392. **Advanced Methods, Materials, and Techniques for Educating the Child with Minimal Brain Dysfunction (3:3:0).** Prerequisite: SPED 4338 or 5390, 4361, 4352, or equivalent courses. Intensive study of various methods, techniques, and materials for alleviating and/or overcoming learning disabilities in children with minimal brain dysfunction.

School of Engineering

Engineering has been defined as the "scientific utilization of the forces and materials of nature in the construction, production, and operation of works for the benefit of man." The fundamental training of the engineer includes a knowledge of pure science, as well as its application to the various specializations.

The aim of the School 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 to the development of scientific 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 student's later employment. Experience has shown that this type of training produces the most successful engineers.

Upon graduation, the student usually spends a period of time in subordinate positions, obtaining experience and preparing himself for the more important work of the executive, designer, consulting engineer, teacher, researcher, or supervisor of manufacturing operations. From 60 to 70 percent of graduates in engineering have attained executive positions. Engineering training is recognized as desirable preparation for a commercial career. Indeed, surveys of employment records disclose that men possessing an engineering education have found their way into nearly every type of vocation. A few which the engineering student may reasonably expect to enter upon graduation, or after a period of practical experience, are indicated below in the descriptions of degree programs. 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 suitable than that leading to an engineering degree.

Undergraduate Degrees. The School of Engineering offers the following four-year curricula, each leading to the degree of Bachelor of Science in the respective field of engineering: agricultural, chemical, civil, electrical, mechanical, industrial, petroleum, engineering physics, and textile. The degree of Bachelor of Science in Textile Technology and Management is also available under the administration of the Textile Engineering Department. In the Department of Architecture, two five-year curricula are offered leading to the degrees of Bachelor of Architecture with a design option or construction option.

The School 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 School of Engineering. The requirements for an engineering degree include many courses that are common to all

engineering degree plans. Many 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.

General regulations that apply to all degrees:

1. A student 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 he must earn credit in college courses in algebra and/or trigonometry. An alternate freshman curriculum is provided for those students with inadequate preparation in mathematics.

2. A student in the School of Engineering is expected to earn credit in the particular courses listed in one of the curricula and to follow the sequence of courses therein recommended.

3. Any substitution or deviation in subject matter specified in a curriculum requires the written approval of the Dean of the School of Engineering and the chairman of the student's major department. Electives require the written approval of the department chairman.

4. Courses transferred from another institution will be evaluated by the office of the Dean of the School of Engineering for substitutions in a given curriculum.

5. With the approval of a student's major department chairman, 3 hours of the advanced ROTC credits may be counted for nontechnical elective courses.

6. General College 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 School 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 School of Engineering.

7. A student who expects to receive a degree during a particular year must file an "Application for Degree" with the office of the Dean of the School of Engineering during the spring semester of the preceding year. Prior to his fall registration he will receive a list of courses and be apprised of the number of grade points which he lacks.

In making this application, the student must indicate the year's catalog under which he plans to graduate, since he must meet the requirements of a specific year's catalog in their entirety. This must be a year during which he registered as a student in the School 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 College.

8. A student who has completed the requirements for his first bachelor's degree from the School of Engineering may acquire a second by completing the curriculum prescribed for it, together with a minimum of 27 additional hours of required work, the precise number of additional hours being determined by the particular specialization in which the degree is sought.

Freshman Programs. Recommended qualifications for admission to the School of Engineering are given in the Admissions section of this catalog. Students meeting these requirements, as shown by the high school records and the placement tests, will be assigned to the freshman program shown in the departmental curriculum. Entering engineering and architecture (construction option) students with inadequate preparation in mathematics will be required to complete MATH 1315, Introductory College Mathematics; or MATH 133, College Algebra; and/or MATH 131, Trigonometry. The most satisfactory plan to complete these courses without delay is to attend the summer school before the first long session.

Engineering students who need algebra and trigonometry, but who are unable to take advantage of the summer school, should schedule the following:

Alternate Freshman Year for Engineering Students.

Fall		Spring	
MATH 131, Trigonometry	3	MATH 151, Anal. Geom. & Calc. I	5
MATH 133, Coll. Alg.	3	ENG 132, Coll. Rhet.	3
EGR 136, Engr. Graphics I	3	EA&D 135, Engr. Anal. I	3
ENG 131, Coll. Rhet.	3	CHEM 142, Gen. Chem.	4
CHEM 141, Gen. Chem.	4		
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16*		15*	

SUMMER SESSION, Second Term
MATH 152, Anal. Geom. & Calc. II 5

* Exclusive of P.E., Band, or Basic ROTC.

Similar adjustment to compensate for deficiencies in recommended admission requirements can be made in the freshman programs in architecture—design option and construction option, and in textile technology and management.

Special consideration will be given to applicants with strong high school backgrounds, even though they may not meet some of the specific entrance requirements. It should be noted, however, that most students who are admitted with fewer than the recommended qualifications should anticipate its requiring more than two semesters for the completion of the freshman program.

Advanced Degrees in Engineering. Programs are available through the School of Engineering leading to Master of Science and Doctor of Philosophy degrees in the fields of chemical, civil, electrical, industrial, and mechanical engineering, and to a Doctor of Philosophy degree with interdisciplinary combinations of the engineering fields and/or the physical and biological sciences and mathematics.

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 *Catalog of the Graduate School*.

Department of Agricultural Engineering

The Department of Agricultural Engineering administers the following degree programs: *AGRICULTURAL ENGINEERING, Bachelor of Science in Agricultural Engineering* and *Master of Science in Agricultural Engineering*, and *MECHANIZED AGRICULTURE, Bachelor of Science*. This department is under the joint supervision of the School of Engineering and the School of Agriculture. Agricultural engineering is the application of engineering principles to the agricultural industry. See the section on the School of Agriculture for a description of the department and its course offerings. The curriculum for the B.S. degree program in Agricultural Engineering is given in the accompanying table.

Agricultural Engineering Curriculum.

Fall		FIRST YEAR*		Spring	
AGED 111, The Ag. Industry	1	AG E 122, Constr. Maths. & Fabri.	2		
AGRO 131, Prin. of Agronomy	3	A H 131, Animal Science	3		
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3		
EGR 136, Engr. Graphics I	3	EA&D 135, Engr. Analysis I	3		
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5		
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC			
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15**		16**			
Fall		SECOND YEAR		Spring	
AECO 235, Prin. of Ag. Eco.	3	AG E 233, Engr. Instr. & Contr.	3		
AG E 232, Plane & Topo. Surv.	3	CE 233, Statics	3		
CHEM 141, Gen. Chem.	4	CHEM 143, Gen. Chem.	4		
MATH 235, Anal. Geom. & Calc. III	3	MATH 335, Math. for Engr. & Soits. I	3		
PHYS 143, Prin. of Physics I	4	PHYS 241, Prin. of Phys. II	4		
P.E., Band of Basic ROTC		P.E., Band of Basic ROTC			
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17**		17**			
Fall		THIRD YEAR		Spring	
AG E 336, Prin. Ag. Mach. Des.	3	EE 234, Electronic Instr.	3		
AGRO 241, Soils	4	CE 3311, Mech. of Solids	3		
CE 332, Dynamics	3	CE 3351, Mech. of Fluids	3		
EE 233, Elec. Systems Anal.	3	GOVT 231, Amer. Govt., Org.	3		
ME 3314, Mechanisms	3	ME 3321, Engr. Thermo. I	3		
Elective	2	Elective (Humanity)	3		
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FOURTH YEAR

Fall		Spring	
AG E 411, Seminar	1	AG E 433, Elem. of Tractor Des.	3
AG E 436, Ag. Proc. Systems	3	AG E 434, Farm Elec. Sys.	3
AG E 438, Funct. Des. of Ag. Struct.	3	AG E 437, Des. of Irrig. Sys.	3
AG E 442, Engr. Soil & Water Conser.	4	AG E 439, Struct. Des. Farm Bldg.	3
GOVT 232, Amer. Govt., Funct.	3	HIST 232, Hist. of U.S. since 1877	3
HIST 231, Hist. of U.S. to 1877	3	Elective	3
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17		18	

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—136.

* See Alternate Freshman Year in the School of Engineering.

** Exclusive of P.E., Band, or Basic ROTC.

Courses in Agricultural Engineering. See course listings of Agricultural Engineering Department under School of Agriculture section.

Department of Architecture

This department supervises the following degree program: ARCHITECTURE, *Bachelor of Architecture*, with options in Construction or Design. The undergraduate degree requirements are given in the accompanying tables.

Programs in the Department of Architecture concentrate on the concept that architecture and design are embodiments of the attitudes and ideas of society; that man's needs and requirements are basic to the realization of form and functional expressions; that the requirements of man's changing environment are major factors in design determination.

A common core of design courses applies to both degree plans. Architecture majors are urged to spend summer months working in the offices of registered architects.

Departmental Affiliations. The Department of Architecture is affiliated with the following organizations:

1. Association of Collegiate Schools of Architecture
2. National Institute of Architectural Education
3. The American Federation of Art
4. The College Art Association
5. Tau Sigma Delta (National honor society in Architecture and Allied Arts)

A growing emphasis is being placed on research, especially on aspects applied to the unique geographic problems of this locale. The faculty includes members qualified by the Office of Civil Defense for fallout shelter analysis and those trained in documentation and preservation of historic structures, in cooperation with the Historical American Building Survey.

Degrees in architecture are accredited by the National Architectural Accreditation Board. Most of the faculty are registered architects and hold individual memberships in the American Institute of Architects, American Institute of Planners, American Society of Planning Officials, and Association of Collegiate Schools of Architecture.

General. 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 maintains a reference library under the supervision of a trained librarian and receives research material pertinent to design problems in progress at all levels. Reference sources include valuable training aids provided by the Carnegie Foundation and an extensive collection of photographic plates and slides.

Many courses in architecture, especially those in city planning and history of architecture, history of landscape architecture, and freehand drawing, are available for electives to students majoring in other departments. Consent of the instructor may be secured in lieu of the professional prerequisites listed.

Majors in architecture may not register for work in the Advanced Undergraduate Program which starts with the junior year until certified to be eligible by the department. To qualify for certification a student must have completed the program for the first two years in its entirety with a minimum grade-point average of 2.00. A grade-point average of not less than 2.00 must be maintained in the professional course work.

Elective courses must be approved by the chairman of the department. Students are strongly urged to take elective courses in the humanities or instructional disciplines other than architecture and art.

Architecture Curriculum, Construction Option.**FIRST YEAR**

Fall		Spring	
ARCH 121, Freehand Drawing	2	ARCH 122, Freehand Drawing II	2
ARCH 133, Intro. to Des. & Theory	3	ARCH 134, Arch. Graphics	3
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
Elective	3	Elective	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	

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SECOND YEAR

Fall		Spring	
ARCH 241, Arch. Des., Grade II	4	ARCH 242, Arch. Des., Grade II	4
ARCH 323, Hist. of Mod. Arch.	2	ARCH 330, Hist. of Arch.:	
ARCH 234, Natl. & Meth. of Constr.	3	Ancient/Medieval	3
MATH 235, Anal. Geom. & Calc. III	3	PHYS 241, Prin. of Physics II	4
PHYS 143, Prin. of Physics I	4	C E 233, Statics	3
ARCH 211, Arch. Esthetics	1	ENG 231, Mast. of Lit.	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	

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THIRD YEAR

Fall		Spring	
ARCH 351, Arch. Des., Grade III	5	ARCH 352, Arch. Des., Grade III	5
ARCH 432, Hist. of Ren. Arch.	3	ARCH 337, Prin. of City Planning	3
ARCH 335, Mech. Equip. of Bldgs.	3	ARCH 336, Mech. Equip. of Bldgs.	3
C E 3341, Struct. Anal. I	3	C E 3342, Struct. Anal. II	3
C E 3311, Mech. of Solids	3	SPCH 338, Bus. & Prof. Speech	3

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FOURTH YEAR

Fall		Spring	
ARCH 451, Arch., Des., Grade IV	5	ARCH 436, City Planning	3
ARCH 333, Arch. Structures	3	ARCH 452, Arch. Des., Grade IV	5
C E 4343, Reinf. Concr. Struct. I	3	ARCH 334, Arch. Structures	3
Elective	3	C E 4344, Reinf. Concr. Struct. II	3
C E 231, Plane Surveying	3	Elective	3

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FIFTH YEAR

Fall		Spring	
ARCH 420, Prof. Practice	2	Elective	3
ARCH 435, Building Technology	3	C E 4342, Struct. Design II	3
C E 4341, Struct. Des. I	3	C E 3201, Portland Cem. Concr. Tech.	2
C E 3211, Mech. of Solids Lab.	2	C E 3321, Soil Engr. Science	3
HIST 231, Hist. of U.S. to 1877	3	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	HIST 232, Hist. of U.S. since 1877	3
ARCH 410, Seminar	1	C E 3121, Soil Engr. Sci. Lab.	1

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Minimum hours required for graduation, exclusive of P.E., Band or Basic ROTC—169.

* Exclusive of P.E., Band, or Basic ROTC.

Architecture Curriculum, Design Option.**FIRST YEAR**

Fall		Spring	
ARCH 121, Freehand Drawing I	2	ARCH 122, Freehand Drawing II	2
ARCH 133, Intro. to Des. & Theory	3	ARCH 134, Arch. Graphics	3
Foreign Language	4	MATH 131, Trigonometry	3
MATH 133, Coll. Algebra	3	Foreign Language	4
ENG 131, Coll. Rhetoric	3	ENG 132, Coll. Rhetoric	3
P.E., Band, or Basic ROTC		Elective	3
		P.E., Band, or Basic ROTC	

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SECOND YEAR

Fall		Spring	
ARCH 241, Arch. Des., Grade II	4	ARCH 242, Arch. Des., Grade II	4
ARCH 323, Hist. of Modern Arch.	2	ARCH 330, Hist. of Arch.:	
ARCH 224, Freehand Drawing III	2	Ancient/Medieval	3
ARCH 234, Matl. & Meth. of Constr.	3	ARCH 225, Beg. Watercolor	2
PHYS 141, Gen. Physics	4	PHYS 142, Gen. Physics	4
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
P.E., Band, or Basic ROTC		ARCH 211, Arch. Esthetics	1
		P.E., Band, or Basic ROTC	

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THIRD YEAR

Fall		Spring	
ARCH 351, Arch. Des., Grade III	5	ARCH 352, Arch. Des., Grade III	5
ARCH 432, Hist. of Ren. Arch.	3	C E 338, Struct. Mech.	3
C E 337, Struct. Mech.	3	Elective	3
ENG 231, Mast. of Lit.	3	ARCH 336, Mech. Equip. of Bldgs.	3
ARCH 335, Mech. Equip. of Bldgs.	3	ARCH 337, Prin. of City Planning	3

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FOURTH YEAR

Fall		Spring	
ARCH 451, Arch., Des., Grade IV	5	ARCH 452, Arch. Des., Grade IV	5
ARCH 333, Arch. Structures	3	ARCH 436, City Planning	3
C E 435, Simple Th. Reinf. Concr.	3	ARCH 334, Arch. Structures	3
ARCH 420, Prof. Practice	2	Elective	3
ARCH 426, Anat. & Life Drawing	2	SPCH 338, Bus. & Prof. Speech	3
Elective	3		
	18		17

FIFTH YEAR

Fall		Spring	
ARCH 440, Arch. Des. & City Planning, Grade V	4	ARCH 461, Arch. Des. Grade V	6
ARCH 422, Design Program	2	Elective	3
ARCH 4316, Arch. Sculpture	3	ARCH 4317, Arch. Sculpture	3
ARCH 435, Building Technology	3	GOVT 232, Amer. Govt., Funct.	3
GOVT 231, Amer. Govt., Org.	3	ARCH 425, Arch. Des.: Thesis	2
ARCH 410, Seminar	1		
	16		17

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—170.
 * Exclusive of P.E., Band, or Basic ROTC.

Courses in Architecture.

FOR UNDERGRADUATES

- 121, 122. **Freehand Drawing I, II (2:0:6 each).** Representational drawing in charcoal emphasizing fundamental skills. Culminating work introducing color with pastels.
133. **Introduction to Design and Theory (3:3:0).** Study of man and his environment and the influences of environment on the design professions. Introduction to design principles.
134. **Architectural Graphics (3:1:6).** Study of descriptive geometry, architectural shades and shadows and perspective methods. Basic problems in projections.
211. **Architectural Esthetics (1:1:0).** Prerequisite: ENG 132. Architecture as a contemporary philosophical concept. Lectures and visual experiences to develop perceptive faculties in the esthetics of architecture.
224. **Freehand Drawing III (2:0:6).** Prerequisite: ARCH 121, 122. Pencil, pen and ink rendering, and sketching from life and nature.
225. **Beginning Watercolor (2:0:6).** Prerequisite: ARCH 122. Watercolor painting from life and from nature.
228. **A History of Modern Cities (2:2:0).** Prerequisite: Sophomore standing. A study of cities of the world since the Industrial Revolution, emphasizing the form, organization, and order of urban development and man's involvement with the forces that create human environment.
230. **Survey of Architectural History of the Western World (3:3:0).** Survey of architectural history of western world from ancient civilization to mid-twentieth century emphasizing relationship of climate, geography, culture, resources, and technical developments. Not available for credit to architecture majors.
234. **Materials and Methods of Construction (3:3:0).** Prerequisite: ARCH 133, 134. Introduction to properties, specifications, and uses of architectural materials and analysis of structural systems related to architecture.
235. **Architecture of Mexico and the Spanish Southwest (3:3:0).** Prerequisite: Sophomore standing. Critical evaluation of architecture and culture of the areas of Spanish conquest and colonization in South, Central, and North America with specific emphasis on Mexico and the Southwest U.S.A.
- 241, 242. **Architectural Design, Grade II (4:0:12 each).** Prerequisite: ARCH 133, 134. Application of the basic principles of design with emphasis on the three-dimensional problems leading to 6-hour to 48-hour projects under individual criticism dealing with elements of plan and evaluation. Introduction to project-completion method of study. 9-hour problems emphasizing composition and presentation.
321. **Design Workshop (2:0:6).** Prerequisite: ARCH 242 or equivalent. Project development in architectural design. May be repeated for credit.
326. **Anatomy and Life Drawing (2:0:6).** Prerequisite: ARCH 224. Study of anatomical structure. Drawing from life.
331. **Fundamentals of Residential Architecture (3:3:0).** Prerequisite: Junior standing. Fundamentals of residential architecture, including historical, aesthetic, and economic problems in the design of housing, with emphasis on single family dwellings.
332. **History of Landscape Architecture (3:3:0).** Prerequisite: Junior classification. Historical survey of landscape design, with applications to the present time. Illustrated lectures.
- 333, 334. **Architectural Structures (3:2:3 each).** Prerequisite: ARCH 352, 336. Application of structural theory to specific building requirements, code restrictions, and fabrication limitations. Preparation of details and visits to projects under construction.
- 335, 336. **Mechanical Equipment of Buildings (3:3:0 each).** Prerequisite: ARCH 234 and 242. Heating and air-conditioning requirements and systems for buildings. Basic theory and problems in illumination and acoustics.
337. **Principles of City Planning (3:3:0).** Prerequisite: ARCH 242 or junior standing. Comprehensive background in planning principles which will contribute to the total understanding of architecture as students and as professionals in an urban society and environment.
339. **Fall-out Shelter Analysis (3:3:0).** Prerequisite: Architecture major, ARCH 451 and C E 435; engineering majors, senior classification. Analysis of effects of nuclear weapons, nuclear shielding calculation methodologies, environmental factors in shelter design and application of basic principles of design to shelter systems and their utilization. Those successfully completing course will be awarded Department of Defense Certificate of Proficiency upon graduation.
- 351, 352. **Architectural Design, Grade III (5:2:9 each).** Prerequisite: ARCH 241, 242. 15-hour to 75-hour problems under individual criticism dealing with small building types. The project-completion method of study is used. 9-hour sketch problems dealing with details of architecture and with larger architectural compositions.

410. **Seminar (1:1:0).** Prerequisite: Fifth year standing in architecture. Papers on subjects relating to architecture presented for discussion. For candidates for degree of Bachelor of Architecture only.
422. **Design Program (2:1:3).** Prerequisite: ARCH 440 or concurrent enrollment in ARCH 440. Preliminary study, research, and conferences to develop complete program for terminal problem in ARCH 461 and 425.
425. **Architectural Design: Thesis (2:0:6).** Prerequisite: ARCH 461 or concurrent registration in ARCH 461. Coordination of research and preparation of written thesis supporting project completed in ARCH 461.
440. **Architectural Design and City Planning, Grade V (4:0:12).** Prerequisite: ARCH 451, 452. 24-hour to 72-hour problems under individual criticism dealing with large compositions involving groups of buildings, site planning, and transportation and circulation.
- 451, 452. **Architectural Design, Grade IV (5:2:9 each).** Prerequisite: ARCH 351, 352. 15-hour to 90-hour problems under individual criticism dealing with more comprehensive building types and groups of buildings. 9-hour sketches are offered to test creative ability and expression in a limited amount of time.
461. **Architectural Design, Grade V (6:0:18).** Prerequisite: ARCH 440 and 422. Development and design of terminal thesis problem programmed in ARCH 422.

FOR UNDERGRADUATES AND GRADUATES

323. **History of Architecture: 19th and 20th Centuries (2:2:0).** Prerequisite: For architecture majors, ARCH 133, 134; for others, none. Cultural and social influences as they determine the development of the 19th and 20th century architecture in Europe and the Americas. Illustrated lectures.
330. **History of Architecture: Ancient/Medieval (3:3:0).** Prerequisite: For architectural majors, ARCH 323; for others, none. Architectural contributions of ancient, classic, and medieval civilizations and their relation to cultural heritage and development of the western world. Illustrated lectures.
420. **Professional Practice (2:2:0).** Prerequisite: Senior standing. Office organization, ethics, professional relations for architects.
430. **History of Early American Architecture (3:3:0).** Prerequisite: ARCH 432 and consent of instructor. The American architectural heritage. Pre-Columbian, Southwestern Colonial, regional styles of the eastern seaboard, Western Reserve, and Greek Revival. Illustrated lectures.
432. **History of Renaissance Architecture (3:3:0).** Prerequisite: ARCH 330. The Renaissance architecture of Europe, emphasizing the development of styles essential to an understanding of the background of early American and modern architectural growth. Illustrated lectures.
435. **Building Technology (3:1:6).** Prerequisite: ARCH 334 and 336. Synthesis of mechanical, electrical, and acoustical problems relative to design and structural considerations. Preparation of calculations, working drawings, and architectural details.
436. **City Planning (3:1:6).** Prerequisite: Senior standing. The theory and problems of city development, community planning, housing, and their drawn and rendered solutions under individual criticism.
- 4316, 4317. **Architectural Sculpture (3:1:6 each).** Prerequisite: Senior standing. Problems in modeling, carving, and combined techniques using clay, wood, metal, plaster, and other materials. Study of the historic development of sculptural techniques. Plaster-mold making, glazing, and firing.
4321. **History of Architecture and Art in the Arid Lands of the World (3:3:0).** Prerequisite: Junior standing. An investigative study of the architecture and art of arid lands, ancient and modern, and the geographic and climatic conditions influencing them.
4331. **Special Problems in Architecture and City Planning (3:3:0).** Prerequisite: Advanced standing and approval of the department chairman. Individual studies in advanced architecture and city planning of special interest to students. May be repeated for credit.

Department of Chemical Engineering

This department supervises the following degree programs: **CHEMICAL ENGINEERING, Bachelor of Science in Chemical Engineering, Master of Science in Chemical Engineering, Doctor of Philosophy.** In addition to the Engineering School requirements for graduation, chemical engineering students must have a minimum grade point average of 2.00 in all courses in their major field. Only one D will be accepted in a course, completion of which requires two semesters. The undergraduate degree requirements appear in the accompanying curriculum table.

Chemical Engineering Curriculum.

FIRST YEAR*

Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
EA&D 135, Engr. Anal. I	3	E GR 136, Engr. Graphics	3
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	

SECOND YEAR

Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	PHYS 241, Prin. of Physics	4
PHYS 143, Prin. of Physics I	4	E E 234, Electronic Instr.	3
E E 233, Elect. Sys. Anal.	3	MATH 335, Higher Math. for	
CHEM 335, Organic Chem.	3	Engr. & Scis. I	3
CHEM 315, Organ. Chem. Lab.	1	CHEM 336, Organic Chem.	3
GOVT 231, Amer. Govt., Org.	3	CHEM 316, Organic Chem. Lab.	1
P.E., Band, or Basic ROTC		GOVT 232, Amer. Govt., Funct.	3
	17**	P.E., Band, or Basic ROTC	

SUMMER SESSION

First Term		Second Term	
CH E 3311, Chem. Engr. I	3	CH E 3312, Chem. Engr. II	3
C E 233, Statics	3	C E 3311, Mech. of Solids	3
	6		6

THIRD YEAR

Fall		Spring	
CHEM 347, Physical Chem.	4	CHEM 348, Physical Chem.	4
CH E 4311, Chem. Engr. III	3	CH E 4312, Chem. Engr. IV	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
CH E 3351, Anal. Instr.	3	Elective (Humanity)	3
Elective	3	CH E 330, Engr. Matl. Science	3
	16	CH E 3111, Chem. Engr. Lab.	1
			17

FOURTH YEAR

Fall		Spring	
CH E 4321, Chem. Engr. Thermo.	3	CH E 4322, Chem. Engr. Thermo.	3
CH E 4241, Unit Oper. Lab.	2	CH E 4242, Unit Oper. Lab.	2
CH E 4353, Process Instr.	3	CH E 4354, Chem. Engr. Plant Des.	3
CH E 4352, Process Design	3	Elective	3
Elective (Technical)	3	Elective (Technical)	3
	14		14

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—137.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

Courses in Chemical Engineering.

FOR UNDERGRADUATES

330. Engineering Materials Science (3:3:0). Prerequisite: CHEM 142, PHYS 143. Fundamental properties of engineering materials. Inter-atomic and intermolecular binding forces and energies; thermal energies; crystal structure; amorphous solids; aggregates and imperfections. Physical basis for common electrical, magnetic, and thermal properties.
3111. Chemical Engineering Laboratory (1:0:3). Prerequisite: CHEM 142. Elementary engineering measurement of the chemical and physical properties of materials of commercial importance.
3311. Chemical Engineering I (3:3:0). Prerequisite: CHEM 142, PHYS 143. Material and energy balances for engineering systems subjected to chemical or physical transformations.
3312. Chemical Engineering II (3:3:0). Prerequisite: CH E 3311. Basic principles of the unit operations, including the fundamentals of heat, mass, and momentum transport.
3351. Analytical Instrumentation (3:2:3). Corequisite: CHEM 335. Analytical tools used for instrumental analysis and control of process plants.

FOR UNDERGRADUATES AND GRADUATES

4121. Chemical Engineering Seminar (1:1:0). Prerequisite: Advanced standing and approval of the department chairman. Individual study of chemical engineering problems of special interest and value to the student. May be repeated for credit in different areas.
- 4241, 4242. Unit Operations Laboratory (2:0:6 each). Prerequisite: CH E 4311. Laboratory experiments on the unit operations of chemical engineering, with written reports.
- 4311, 4312. Chemical Engineering III, IV (3:3:0 each). Prerequisite: CH E 3312. Theory and practice of such selected unit operations of chemical engineering as fluid flow, heat transmission, evaporation, distillation, and extraction, all illustrated by the solution of numerous problems.
- 4321, 4322. Chemical Engineering Thermodynamics (3:3:0 each). Prerequisite: Advanced standing. A problem course applying the laws and principles of thermodynamics to physical and chemical systems and processes.
4323. Chemical Reaction Engineering (3:3:0). Prerequisite: CHEM 348. An introduction to the kinetics of chemical conversion processes and the design of chemical reactors.
4331. Special Problems in Chemical Engineering (3:3:0). Prerequisite: Advanced standing and approval of department chairman. Individual studies in advanced engineering areas of special interest. May be repeated for credit.
4332. Special Experimental Problems in Chemical Engineering (3:0:9). Prerequisite: Advanced standing and approval of department chairman. Individual experimental studies in an area of special interest to student. May be repeated for credit.
4341. Unit Processes (3:3:0). Prerequisite: CHEM 353, CH E 4311. Process analysis and synthesis; integration of unit processes and unit operations into operable processing schemes.
4342. Polymer Science and Technology (3:3:0). Prerequisite: CHEM 335. 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.
4352. **Process Design (3:3:0).** Prerequisite: CHE 4312. A problem course on the application of engineering and economic principles to the design of chemical processes.
4353. **Process Instrumentation (3:2:3).** Prerequisite: CHE 3312. Characteristics of industrial instruments and their manner of use in controlling process variables.
4354. **Chemical Engineering Plant Design (3:1:6).** Prerequisite: CHE 4352 or consent of instructor. Development of process and equipment designs for integral manufacturing plants.
4371. **Nuclear Engineering (3:3:0).** Prerequisite: Thermodynamics. Basic principles applicable to engineering problems of the atomic energy field.

FOR GRADUATES

5121. **Graduate Seminar (1:1:0).** Required of all chemical engineering graduate students. May be repeated for credit.
5311. **Transport Phenomena—Heat Transmission (3:3:0).** Fundamental relations governing energy, momentum, and mass transfer between phases, with special emphasis on heat transmission.
5312. **Transport Phenomena—Fluid Dynamics (3:3:0).** Fundamental relations governing energy, momentum, and mass transfer between phases, with special emphasis on fluid dynamics.
5313. **Transport Phenomena—Diffusion Processes (3:3:0).** Fundamental relations governing energy, momentum, and mass transfer between phases, with special emphasis on diffusion processes.
5314. **Process Dynamics and Automatic Control (3:3:0).** Study of the transient behavior of process systems: methods of analysis; synthesis and simulation of control systems; introduction to analog and digital computer control.
5321. **Advanced Chemical Engineering Thermodynamics (3:3:0).** Advanced topics in thermodynamics and its applications to processes and operations.
5322. **Equilibrium Systems (3:3:0).** General equations of equilibrium of multicomponent, multiphase systems; the concept of chemical potential and the phase rule; selected techniques for predicting physical and chemical equilibria in both ideal and non-ideal systems.
5331. **Special Problems in Chemical Engineering (3:3:0).** Prerequisite: Approval of department chairman. Individual study of theoretical projects under the guidance of a member of the staff. May be repeated for credit in different areas.
5332. **Experimental Studies in Chemical Engineering (3:0:9).** Prerequisite: Approval of department chairman. Individual study of experimental projects under the guidance of a member of the staff. May be repeated for credit in different areas.
5341. **Distillation (3:3:0).** Theory of distillation, with special emphasis on multicomponent distillation and application of theory to problems of design.
5343. **Reaction Kinetics (3:3:0).** Theoretical and experimental aspects of the kinetics of uncatalyzed and catalyzed reactions and their mechanism. Rate theory and its application to the design of batch and flow reactors.
5348. **Organic Syntheses (3:3:0).** The major organic unit processes; equipment, reaction theory, and the unitary aspects of each organic unit process are considered.
5351. **Chemical Engineering Design (3:1:6).** Design of the complete plant. Plant location, equipment design or selection, plant layout, building requirements, and estimation of the cost of the plant.
- 5371, 5372. **Principles of Nuclear Engineering (3:3:0 each).** Prerequisite: Graduate standing in engineering, mathematics, or the physical sciences. This course is the basis for all other course work in the nuclear field.
- 5373, 5374. **Nuclear Chemical Engineering (3:3:0 each).** Nuclear reactions, reactor fuel cycles, production of nuclear feed materials, properties of irradiated fuels, and separation processes.
5378. **Reactor Shielding (3:3:0).** Data and techniques available for the design of a practical shield.
5379. **Nuclear Reactor Instrumentation and Control (3:3:0).** Reactor safety systems and automatic control equipment; the effects of such parameters as temperature and fission product poisons on reactor control, feedback loops in power reactors, and reactor simulation.
- 5381, 5382. **Nuclear Radiations Laboratory (3:2:6 each).** The instruments and techniques used directly or indirectly in the nuclear field. The student will be allowed to a limited extent to carry out research problems as the course develops.
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required at least twice.
- 731, 732. **Research (3 each).**
831. **Doctor's Dissertation (3).** Enrollment required at least four times.

Department of Civil Engineering

This department supervises the following degree programs: *CIVIL ENGINEERING, Bachelor of Science in Civil Engineering, Master of Science in Civil Engineering, Doctor of Philosophy.* The undergraduate degree requirements appear in the accompanying curriculum table.

Civil Engineering Curriculum.

FIRST YEAR*

Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhét.	3	ENG 132, Coll. Rhét.	3
EA&D 135, Engr. Anal. I	3	EGR 136, Engr. Graphics	3
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	

SECOND YEAR

Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	PHYS 241, Prin. of Physics II	4
PHYS 143, Prin. of Physics I	4	EE 234, Electronic Instr.	3
EE 233, Elec. Sys. Anal.	3	MATH 335, Higher Math. for Engrs. & Scits. I	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
Elective (Humanity)	3	CE 233, Statics	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
16**		16**	

THIRD YEAR

Fall		Spring	
MATH 336, Higher Math. for Engrs. & Scits. II	3	GEOL 233, Geol. for Engrs.	3
CE 231, Plane Surveying	3	CE 330, Engr. Matl. Sci.	1
CE 332, Dynamics	3	CE 3121, Soil Engr. Sci. Lab.	1
CE 3151, Mech. of Fluids Lab.	1	CE 3201, Constr. Matls.	2
CE 3211, Mech. of Solids Lab.	2	CE 3321, Soil Engr. Sci.	3
CE 3311, Mech. of Solids	3	CE 3342, Struct. Anal. II	3
CE 3341, Struct. Anal. I	3	CE 3351, Mech. of Fluids	3
18		18	

FOURTH YEAR

Fall		Spring	
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
ME 3321, Thermodynamics	3	CE 3371, Water & Waste Treat.	3
CE 4331, Special Prob. in Civil Engr.	3	CE 4331, Spec. Prob. in Civil Engr.	3
CE 4343, Reinf. Concr. Struct. I	3	Electives (Technical)	9
CE 4354, Surface Hydrology or CE 4361, Highway Engr. I	3		
Elective (Technical)	3		
18		18	

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—134.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

Courses in Civil Engineering.

FOR UNDERGRADUATES

231. Plane Surveying (3:2:3). Prerequisite: MATH 151. Precision of measurements; differential and profile leveling; transit stadia; open and closed traverses; area calculations; circular and parabolic curves.
233. Statics (3:3:0). Prerequisite: MATH 152, PHYS 143. Equivalent force systems, equilibrium of force systems, friction, centroids, moments of inertia, introduction to structural mechanics.
332. Dynamics (3:3:0). Prerequisite: CE 233, MATH 335. Motion of particles and of rigid bodies.
337. Structural Mechanics I (3:3:0). Prerequisite: MATH 131. Statics for students of architecture, design option, and others who desire a condensed presentation of the material.
338. Structural Mechanics II (3:3:0). Prerequisite: CE 337. Mechanics of solids for students of architecture, design option, and others who desire a condensed presentation of the material.
3121. Soil Engineering Science Laboratory (1:0:3). Prerequisite: Concurrent enrollment in CE 3321. Laboratory determination and engineering evaluation of the physical properties of soils.
3151. Mechanics of Fluids Laboratory (1:0:3).
3201. Construction Materials (2:1:3). Studies concerning the physical properties of construction materials.
3211. Mechanics of Solids Laboratory (2:1:3). Prerequisite: Registration in CE 3311. Analytical studies of stress and strain; strain measurements; interpretation of strain data.
3311. Mechanics of Solids (3:3:0). Prerequisite: CE 233. Introductory theory of determination of stress and strain in elastic and inelastic bodies subject to various conditions of loading.
3321. Soil Engineering Science (3:3:0). Prerequisite: CE 3311, concurrent registration in CE 3121. Physical properties of soils; theories of stress, settlement, and consolidation of soils.
3341. Structural Analysis I (3:3:0). Corequisite: CE 3311. The analysis of stress functions in framed structures for fixed and moving load systems.
3342. Structural Analysis II (3:3:0). Prerequisite: CE 3341. The theory of statically indeterminate structures.
3351. Mechanics of Fluids (3:3:0). Prerequisite: CE 332. Hydrostatics; dynamics of viscous and nonviscous fluids; resistance to flow; flow in pipes and open channels.
3371. Water and Waste Treatment (3:2:3). Corequisite: CE 4354. Quality and quantity of water and wastes in municipal and industrial engineering. Laboratory work in the chemistry of water and wastes.
435. Structures (3:3:0). Prerequisite: CE 338. Structures in steel, reinforced concrete, and timber for students of architecture, design option.

FOR UNDERGRADUATES AND GRADUATES

4121. Civil Engineering Seminar (1:1:0). Individual study of engineering problems of special interest and value to the student.
4261. Traffic Engineering (2:1:3). Corequisite: CE 4361. Studies of speed, volume, accidents, time delay studies, and the statistical analysis of data.
4321. Soil Engineering (3:3:0). Prerequisite: CE 3321. Slope stability, lateral earth pressures, pile foundations, bearing capacity, consolidation and settlement, and earth structures.

4331. **Special Problems in Civil Engineering (3:3:0).** Individual studies in advanced engineering areas of special interest. May be repeated for credit.
4332. **Special Experimental Problems in Civil Engineering (3:0:9).** Individual experimental studies in current problems in advanced engineering technology of special interest. May be repeated for credit.
4335. **The Relationship of Technology to Society (3:3:0).** Prerequisite: Advanced standing. A survey of modern technology and its effect on man's society.
4337. **Cost Estimating (3:3:0).** Prerequisite: C E 3311. Estimating costs of construction projects, to include earthwork, pavements and concrete, steel, masonry, and timber structures.
4339. **Law and Ethics in Engineering (3:3:0).** Prerequisite: Senior standing in engineering or approval of department chairman. Professional and industrial problems, contracts, specifications, ethics of engineering.
4341. **Structural Design I (3:2:6).** Prerequisite: C E 3342. Plastic and elastic design in homogeneous materials, with special emphasis on steel and aluminum.
4342. **Structural Design II (3:2:3).** Prerequisite: C E 4341. Advanced theory and design in homogeneous materials for complex structures.
4343. **Reinforced Concrete Structures I (3:3:0).** Corequisite: C E 3342. Design of reinforced concrete structures by elastic and ultimate strength theories.
4344. **Reinforced Concrete Structures II (3:3:0).** Prerequisite: C E 4343. Analysis and design of prestressed concrete members including continuous beams, slabs, tension members, compression members, tanks.
4351. **Intermediate Hydromechanics (3:3:0).** Prerequisite: C E 3351. Hydrokinematics, boundary-layer theory, resistance of immersed bodies, lift and drag.
4353. **Elements of Hydraulic Engineering (3:3:0).** Prerequisite: C E 3351. Dams; channels and pressure conduits; hydraulic machinery; hydroelectric power.
4354. **Surface Hydrology (3:3:0).** The occurrence and distribution of water; precipitation, evapotranspiration, infiltration, runoff.
4355. **Ground Water Hydrology (3:3:0).** Prerequisite: C E 4354. Infiltration; flow of underground water under water table and artesian conditions; development of ground water supplies; recharge of ground water reservoirs.
4361. **Highway Engineering I (3:2:3).** Prerequisite: C E 3321. Route location, planning, traffic engineering, geometric design, drainage, and earthwork; bituminous materials.
4362. **Highway Engineering II (3:3:0).** Prerequisite: C E 4361 and 4343. Design construction, and maintenance of pavements; soil-aggregate roads and soil stabilization.

FOR GRADUATES

5121. **Advanced Soil Engineering Laboratory I (1:0:3).** Laboratory determination and evaluation of the engineering properties of soils.
5122. **Advanced Soil Engineering Laboratory II, (1:0:3).** Prerequisite: C E 5121. Laboratory determination of engineering properties of soils.
5237. **Construction Management (2:2:0).** Management aspects of the construction industry.
5311. **Advanced Mechanics of Solids (3:3:0).** Stress and strain at a point; theories of failure; unsymmetrical bending; curved flexural members; beams on continuous support; energy methods.
5313. **Theory of Elastic Stability (3:3:0).** Theory of the conditions governing the stability of structural members, determination of critical loads for various types of members.
5314. **Theory of Plates and Shells (3:3:0).** Stress analysis of plates and shells of various shapes; small and large deflection theory of plates; membrane theory of shells; general theory of shells.
5316. **Theory of Elasticity (3:3:0).** Several analyses of stress and strain in rectangular and polar coordinates; stress functions; energy methods; finite difference equations; membrane analogy for torsion.
5317. **Theory of Plasticity (3:3:0).** Prerequisite: C E 5316. Stress and strain tensor; theories of yield (Von Mises, Tresca, Mohr, Coulomb); plane stress and plane strain problems; inelastic torsion; viscoelastic behavior of materials.
5321. **Advanced Soil Engineering I (3:3:0).** Specialized topics in the theoretical and practical aspects of foundation and earthwork engineering.
5322. **Advanced Soil Engineering II (3:3:0).** Prerequisite: C E 5321. Earth pressure; stability of deep cuts; stability of dams; settlement of structures; anchored bulkheads.
5331. **5332. Advanced Work in Specific Fields (3:3:0) (3:0:9).** Nature of course and amount of credit depend on the nature of the work and the student's interest and performance. An individual study course.
5342. **Advanced Plastic Design. (3:3:0).** Study of the theory of plastic design of steel frames and multistory buildings.
5343. **Advanced Structural Analysis (3:3:0).** Application of modern design methods to building frames, arches, rigid bents, continuous trusses.
5344. **Advanced Reinforced Concrete Design (3:3:0).** Analysis and design of complex reinforced concrete structures.
5345. **Special Topics in Reinforced Concrete (3:3:0).** Yield-line theory for flat slab; plastic hinges; shear and diagonal tension; bond and other related topics in concrete.
5346. **Design of Structures for Dynamic Loads (3:3:0).** Nature of dynamic loading from earthquake and wind forces; nature of dynamic resistance of structural elements and complete structures; concepts of limit design.
5347. **Matrix Methods of Structural Analysis (3:3:0).** Matrix operations, force method, and stiffness method with applications.
5351. **Open Channel Hydraulics (3:3:0).** Channel geometry and parameters. Uniform and varied flow. Flood routing.
5352. **Hydrodynamics (3:3:0).** Prerequisite: C E 4351, MATH 336. Potential and stream functions; vortex dynamics; wave motions; conformal transformations.
5353. **Water Resources Engineering (3:3:0).** Problems in water resources conservation and utilization with particular emphasis on river basin studies involving multiple water uses.
5355. **Flow in Porous Media (3:3:0).** Single and multiple phase flow in confined and unconfined porous formations toward natural outlets or toward wells.
5356. **Earth Dams (3:3:0).** Selection of dam sites; principles of design of earth dams; flow nets and seepage; selected topics.
5372. **Advanced Water Treatment (3:2:3).** Prerequisite: C E 3371. Water chemistry and microbiology; advanced methods for water quality control; renovation of water for reuse.

5373. **Advanced Waste Treatment** (3:2:3). Prerequisite: CE 3371. Advanced methods of waste treatment including municipal and industrial liquid and solid wastes.
630. **Master's Report** (3).
631. **Master's Thesis** (3). Enrollment required at least twice.
- 731, 732. **Research** (3 each). May be repeated for credit.
831. **Doctor's Dissertation** (3). Enrollment required at least four times.

Department of Electrical Engineering

This department supervises the following degree programs: **ELECTRICAL ENGINEERING, Bachelor of Science in Electrical Engineering, Master of Science in Electrical Engineering, Doctor of Philosophy.**

Each student entering the electrical engineering program will be assigned a faculty adviser and will be responsible for arranging a course of study with his advice and approval. All students enrolled in this program will be required to maintain a grade-point ratio of at least 2.00 in their major field during each semester. Any student who fails to meet this requirement in any given semester must fulfill a program outlined by his faculty adviser before being allowed to proceed.

To be admitted to junior standing as an electrical engineering major, a student must submit a petition to the department prior to his registration for the third year; its acceptance depends upon the student's grade record. He is expected to have an overall grade-point average of 2.00, above average grades in mathematics courses, and C or better in both EE 231 and 232.

Electrical Engineering Curriculum.

FIRST YEAR*

Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
EA&D 135, Engr. Anal. I	3	E GR 136, Engr. Graphics	3
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
	15**		15**

SECOND YEAR

Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	PHYS 241, Prin. of Physics II	4
MATH 335, Higher Math. for Engrs. & Scis. I	3	EE 232, Prin. of Elect. Engr. II	3
PHYS 143, Prin. of Physics I	4	MATH 336, Higher Math. for Engrs. & Scis. II	3
EE 231, Prin. of Elect. Engr. I	3	EE 333, Measurements Lab.	3
GOVT 231, Amer. Govt., Org.	3	EE 3361, Elect. & Mag. Prop. of Matl.	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
	16**		16**

SUMMER SESSION

First Term		Second Term	
CE 233, Statics	3	CE 332, Dynamics or	
ME 3321, Engr. Thermo.	3	EA&D 4313, Var. Methods	3
	6	GOVT 232, Amer. Govt., Funct.	3
			6

THIRD YEAR

Fall		Spring	
EE 3311, Electronics	3	EE 3312, Electronics II	3
EE 3321, Circuit Theory I	3	EE 3322, Circuit Theory II	3
EE 3323, Meth. of Circuit Anal.	3	EE 3332, Experimental Lab. I	3
EE 3341, Electromag. Theory I	3	EE 3342, Electromag. Theory II	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
	15		15

FOURTH YEAR

Fall		Spring	
EE 4333, Experimental Lab. II	3	EE 4332, Spec. Experimental Prob.	3
EE 4351, Energy Conversion I	3	Electives (Technical)	6
Elective (Humanity)	3	Electives	6
Electives (Technical)***	6		15
	15		

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—134.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

*** At least one technical elective must be in the area of thermodynamics or dynamics.

Courses in Electrical Engineering.**FOR UNDERGRADUATES**

- 231, 232. **Principles of Electrical Engineering (3:3:0 each).** Corequisite: MATH 235 or approval of department chairman. Principles of electric and magnetic circuits. Induced and generated electromotive force. Forces on conductors. Fundamentals of alternating current circuits. Fundamentals of resistance, inductance, and capacitance.
233. **Electrical Systems Analysis (3:2:2).** Prerequisite: MATH 235. The language of signals and systems. Mathematical representation of signals and system components. Concept of the transfer function. Elements of analog simulation and computation.
234. **Electronic Instrumentation (3:2:2).** Prerequisite: E E 233. Circuit models, block diagrams, and signal-flow diagrams. Concept of the controlled source. Models for physical devices. Electronic amplifiers and feedback systems. Instrumentation systems.
3311. **Electronics I (3:3:0).** Prerequisite: E E 232. Principles and methods of analysis of high vacuum tubes, gas tubes, rectifiers, photo-tubes, semiconductor diodes, and transistors.
3312. **Electronics II (3:3:0).** Prerequisite: E E 3311. Vacuum tube and transistor amplifiers, oscillators, modulators, demodulators, frequency converters, and wave-shaping circuits.
3321. **Circuit Theory I (3:3:0).** Prerequisite: E E 232. Transient behavior of electrical circuits and other physical systems. Application of differential equation and Laplace transformation techniques. Initial conditions and initial and final value theorems. Single energy-storage systems, double energy-storage systems, and coupled systems.
3322. **Circuit Theory II (3:3:0).** Prerequisite: E E 3321. Theory of nonlinear networks, and parameter formulations.
3323. **Methods of Circuit Analysis (3:3:0).** Prerequisite: E E 232, MATH 336. Rigorous treatment of the mathematical methods available and applicable to the analysis of linear circuits, applications of determinants. Fourier series, and integrals.
3331. **Measurements Laboratory (3:0:9).** Corequisite: E E 232. Detailed experimental study of the measurement problem. Projects assigned to correlate with the material presented in electronics, network theory, and electromagnetic theory. Use of test equipment and measurement devices.
3332. **Experimental Laboratory I (3:0:9).** Prerequisite: E E 3311, 3321, 3331. A laboratory course to accompany third-year basic courses in electrical engineering. Projects assigned to correlate with the theory presented in second-semester junior courses.
3341. **Electromagnetic Theory I (3:3:0).** Prerequisite: Junior standing in engineering. General treatment of static electric and magnetic fields from the vector viewpoint.
3342. **Electromagnetic Theory II (3:3:0).** Prerequisite: E E 3341. General solutions for Maxwell's equations. Traveling waves in scalar media. Boundary conditions and constraints imposed by bounding surfaces.
3361. **Electric and Magnetic Properties of Materials (3:3:0).** Prerequisite: MATH 235, E E 231. Structure of crystals. Application of diffraction techniques. Application to semiconducting materials. Electrical processes in dielectrics.

FOR UNDERGRADUATES AND GRADUATES

4121. **Electrical Engineering Seminar (1:1:0).** Prerequisite: Advanced standing and approval of department chairman. Individual study of engineering problems of special interest and value to the student. May be repeated for credit in different areas.
4311. **Analog and Digital Computation (3:3:0).** Prerequisite: Senior standing in engineering. An introductory treatment of analog and digital computers. Circuit types and components. Number systems. Operational techniques. Storage devices. Input-output equipment. Programming.
4314. **Finite State Machines (3:3:0).** Prerequisite: Senior or graduate standing or consent of the instructor. An introduction to the design and analysis of finite state machines. Transition tables. Minimal and linear machines.
4317. **Electronics III (3:3:0).** Prerequisite: E E 3312. Advanced methods in the analysis and design of electronic circuits. Detailed study of specialized circuits and their integration into functional systems.
4318. **Physical Electronics (3:3:0).** Prerequisite: E E 3312, 3342. Introductory study of the physical properties of electron devices; electron ballistics, thermionic emission, conduction through gases and solids.
4321. **Passive Network Synthesis (3:3:0).** Prerequisite: E E 3322. Properties of positive real functions; synthesis of canonical forms for the two-element kind; extension to three-element kind, methods of Brune, Bott-Duffin, and Bode.
4322. **Topological Network Analysis (3:3:0).** Prerequisite: E E 3322. Fundamentals of linear graphs; topological formulation and theory of contacts; nets; linear programming techniques.
4331. **Special Problems in Electrical Engineering (3:3:0).** Prerequisite: Advanced standing and approval of department chairman. Individual studies in advanced engineering areas of special interest. May be repeated for credit.
4332. **Special Experimental Problems in Electrical Engineering (3:0:9).** Prerequisite: E E 4333. Individual experimental studies in current problems in advanced engineering technology of special interest.
4333. **Experimental Laboratory II (3:0:9).** Prerequisite: E E 3312, 3332, 3341. A laboratory course to accompany fourth-year courses in electrical engineering. Projects assigned to correlate the theory presented in first-semester senior courses.
4341. **Microwave Systems (3:3:0).** Prerequisite: E E 3342. The wave equation and its solution in guiding systems. Discontinuities and impedances in waveguides. Microwave resonators.
4343. **Energy Transmission (3:3:0).** Prerequisite: Senior standing in electrical engineering. Theory and application of transmission lines at power, signal, and high frequencies.
4351. **Energy Conversion I (3:3:0).** Prerequisite: Senior standing in electrical engineering. Elements of energy conversion applied to direct current and alternating current static and rotating machinery.
4352. **Energy Conversion II (3:3:0).** Prerequisite: E E 3341. Elements of energy conversion applied to solid-state static devices, thermionic and solar devices. The principles of magnetohydrodynamics are also discussed.
4353. **Feedback Control Systems (3:3:0).** Prerequisite: Senior standing in engineering. An introduction to the theory of automatic control systems. Flowgraphs and block diagrams. Stability criteria. Prediction of closed-loop time response. System compensation. Components.

4354. **Acoustics (3:3:0).** Prerequisite: Senior standing in engineering. General nature of the acoustics problem. Radiating systems. Dynamical analogies. Microphones and other transducers. Acoustic measurements.
4355. **Nonlinear Feedback Systems (3:3:0).** Prerequisite: EE 4353. Behavior of nonlinear systems, phase plane techniques, describing functions; stability considerations and compensation; discontinuous controllers, limit cycles; optimal systems, quasi-optimal concept, representative adaptive systems; analog simulation.
4361. **Introduction to Information Theory and Noise (3:3:0).** Prerequisite: EE 3312, 3322. Transmission through linear networks; impulse response and convolution; modulation and modulation systems; noise and noise spectra; signal to noise considerations, matched filters; quantization techniques.

FOR GRADUATES

5311. **Stability of Nonlinear Systems (3:3:0).** Prerequisite: Graduate standing. Concepts of stability criteria based upon the methods of Lyapunov and Andronov and Chaiken are applied to nonlinear systems.
5312. **Optimal and Adaptive Control Systems (3:3:0).** Prerequisite: Graduate standing or consent of instructor. Different control systems are discussed and design techniques based upon Pontryagin's Maximum Principle. Wiener's characterization and phase plane plots are applied to the design of the systems. The use of orthogonal functions in optimum control systems is also presented.
- 5313, 5314. **Solid State Electronics I and II (3:3:0 each).** Prerequisite: Graduate standing. Quantum mechanics, physical processes in crystalline solids and other media, characteristics of junction devices; thermoelectric, thermionic and electrochemical devices.
5315. **Sampled Data and Digital Control Systems (3:3:0).** Prerequisite: Graduate standing or consent of instructor. Sampling concepts, Z transform, signal flow graphs and state variable methods applied to sampled data systems are presented.
5317. **Advanced Transients (3:3:0).** Prerequisite: Graduate standing in electrical engineering. Transient analysis using transform methods, with emphasis on physical interpretations. Lumped constant linear approximations. Laplace, Fourier transformations. Convolution processes in real and complex domains. Z transforms. Applications to sampled data systems, difference and cyclic switching.
5318. **Pulse and Timing Circuits (3:3:0).** Prerequisite: Graduate standing in electrical engineering or consent of instructor. Electron devices as switching elements. R-C coupled circuits, multivibrators (bistable, monostable, and astable). Sweep circuits, pulse transformers, blocking oscillators, lines and pulse-forming networks.
5319. **Electronic Circuits and Systems (3:3:0).** Prerequisite: Graduate standing in electrical engineering or consent of instructor. Fundamentals of linear amplifiers, speed of step responses (sag, overshoot, etc.), distributed amplifiers, stagger-tuned amplifiers, synchronous-tuned amplifiers.
5321. **Digital Systems (3:3:0).** Graduate standing in electrical engineering. A detailed treatment of the concepts and procedures involved in the logical design of digital systems. Boolean algebra and applications.
- 5322, 5323. **Advanced Network Theory I and II (3:3:0 each)** Prerequisite: Graduate standing in electrical engineering or consent of instructor. Theory of two-terminal and four-terminal networks, impedance transformation, Foster's theorem and extensions.
5324. **Symmetrical Components (3:3:0).** Prerequisite: Graduate standing in electrical engineering or consent of instructor. The theory of the method of symmetrical components is reviewed and supplemented in detail.
5325. **Information Theory (3:3:0).** Prerequisite: Graduate standing in electrical engineering. Probability theory of finite systems. General properties of channels of various types. Transmission of information. Discrete channels with and without memory. Coding theorems.
5326. **Network Applications of Linear Graph Theory (3:3:0).** Prerequisite: EE 4322 or consent of instructor. The theory of linear graphs is presented in detail. Applications are made to topological formulations, flow graphs, contact networks and switching circuits.
5327. **Multistage Decision Processes (3:3:0).** Prerequisite: Graduate standing. Concepts of linear programming, optimal search, and stochastic processes are presented. Applications to the transportation problem and policy decisions are made.
5328. **Statistical Theory of Communications (3:3:0).** Prerequisite: EE 5317 or consent of instructor. The Fourier methods. Wiener-Hopf criteria, prediction and prediction filters presented. Syntheses of statistical communications networks are discussed.
5331. **Theoretical Investigations in Engineering Applications (3:3:0).** Prerequisite: Graduate standing in engineering. An individual study course involving a rigorous theoretical investigation of some aspect of an engineering problem of current interest. A formal report is required.
5332. **Experimental Investigations in Engineering Applications (3:0:9).** Prerequisite: Graduate standing in engineering. An individual study course involving an experimental investigation of some aspect of an engineering problem of current interest. A formal report is required.
- 5341, 5342. **Advanced Electromagnetic Theory I and II (3:3:0 each).** Prerequisite: Graduate standing in electrical engineering or consent of instructor. Rigorous treatment of the boundary-value problems encountered in the analysis of systems for guiding electromagnetic waves. Reduction of wave-guide and obstacle problems to equivalent network problems.
5343. **Radio Propagation (3:3:0).** Prerequisite: Graduate standing, EE 5342, or consent of instructor. Propagation in a stratified medium; ray theory; ionospheric sounding; transmission problems; cross-modulation and nonlinear effects.
5344. **Antennas and Radiating Systems (3:3:0).** Prerequisite: Graduate standing and EE 5342 or consent of instructor. Huygen's principle. Babinet's principle. Reaction concept and variational principles. Applications to antennas and to general method of calculating results of practical measurements of antenna radiation patterns and impedance. Observations of scattering and diffraction.
5354. **Direct Energy Conversion (3:3:0).** Prerequisite: EE 4352 or consent of instructor. Plasma dynamics, foundations of the production and manipulation of ionized gases. Quantum theory applied to thermoelectric and electrochemical devices.
- 5355, 5356. **Plasma Theory I and II (3:3:0 each).** Prerequisite: EE 4318 and graduate standing. Vector mechanics of many particle systems. Kinetic gas theory. Orbit theory. Particle collisions, ionization phenomenon. Radiation, Boltzmann-Vlasov equation, oscillations. Plasma turbulence and instabilities. Applications and devices.

5357. **Plasma Theory III (3:3:0)**. Prerequisite: E E 5355. Vacuum techniques. Magnetic field design. High power pulsed RF systems. RF shielding and noise reduction techniques, x-ray and infrared measurements.
5358. **Optics, Radiation, and Noise in Quantum Electronics (3:3:0)**. Prerequisite: Graduate standing. Radiation from depolarized and moving particles. Diffraction. Scattering. Incoherent and coherent sources. Reflections and transmission.
5359. **Quantum Electronics (3:3:0)**. Prerequisite: E E 4318, 5371 or the consent of the instructor. Introduction to quantum mechanics. Spectroscopy, transition rates and selection rules. Induced and spontaneous emission, noise, masers and lasers, solid-state devices.
5360. **Physical Optics and Engineering Applications (3:3:0)**. Prerequisite: E E 5359 or 5354 or consent of the instructor. Study of lasers, masers, magneto and electro-optic devices and optical data processing.
- 5361, 5362. **Reliability of Electronic Systems I and II (3:3:0 each)**. Prerequisite: Graduate standing. Concepts of systems effectiveness and maintainability. Data analysis techniques. System analysis techniques applied to electronic systems including probability, reliability, and functional analysis. Reliability management concepts.
5363. **Systems Engineering I (3:3:0)**. Prerequisite: E E 5361. The reliability of and system modelling of maintained and non-maintained systems. Allocation of redundancies.
5364. **Applied Network Theory I (3:3:0)**. Prerequisite: Graduate standing. The theory of linear graphs applied to physical problems. Applications to linear programming techniques, cybernetics, network and stochastic flows.
5371. **Advanced Engineering Analysis I (3:3:0)**. Prerequisite: Graduate standing or consent of instructor. Applications of Tensor analysis, variational techniques, finite difference techniques to electrical engineering problems. Orthogonal functions. Nonlinear oscillations.
5392. **Feedback Control System II (3:3:0)**. The application of linear control system theory to a wide range of problems; including fluid dynamics, chemical processes, mechanical vibrations, and many types of electromechanical systems. A few nonlinear systems are treated.
5393. **Digital Computer Design (3:2:2)**. The application of asynchronous switching circuits, number systems, codes, switching algebra, etc. to design digital computer subsystems. Lab experiments using integrated circuits provide the implementation of the theory.
630. **Master's Report (3)**.
631. **Master's Thesis (3)**. Enrollment required at least twice.
- 6311, 6312. **Solid-State Electronics Laboratory I and II (3:0:9 each)**. Corequisite: E E 5313. Laboratory experiments on the measurement of drift mobility, diffusion length, and lifetime of carriers in semiconductors. Fabrication of silicon-mesa and Gunn diodes. Experiments on the optical and thermoelectric properties of semiconductors.
6321. **Advanced Detection Theory (3:3:0)**. Prerequisite: E E 5325 or consent of the instructor. Filtering and detection of signals from noise. Optimal filter theory. Error correcting codes.
6322. **Switching Circuit Theory II (3:3:0)**. Prerequisite: Graduate standing. Binary and sequential filters. Sequential networks. Detection of coherent and incoherent trains. A posteriori and a priori probability.
6351. **Theory of Plasma Waves (3:3:0)**. Prerequisite: E E 5355 or consent of the instructor. Waves in cold and finite temperature plasmas. Dispersion relations. Free and forced oscillations. Landau damping. Topology of wave normal surfaces.
6352. **Solid State Plasma Theory (3:3:0)**. Prerequisite: E E 5313 and 5354. Plasma oscillations. Wave propagation. Pinch effect. Magnetoreflexions and absorption instabilities.
6371. **Advanced Engineering Analysis II (3:3:0)**. Prerequisite: E E 5371 or equivalent. Application of ordinary and partial differential equations to electrical engineering problems. Sturm-Liouville problem. Series solutions. Guen's functions.
- 731, 732. **Research (3 each)**.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Engineering Analysis and Design

Engineering Analysis and Design courses are offered through the sponsorship of all departments in the School of Engineering. Included in the offerings are courses of interest to both undergraduate and graduate students throughout the College. Beginning and advanced courses in computer programming and technology are available to students desiring minimum or intensive training in this field. In addition, engineering students will find several courses, incorporating computer science and/or mathematical techniques, intended to develop his engineering skills for the solution of large-scale engineering system problems.

Courses in Engineering Analysis and Design.

FOR UNDERGRADUATES

- 123, 124. **Engineering Design and Logic I, II (2:2:0 each)**. The profession of engineering and its relation to energy, materials, resources, computers, communication and control. Basic digital computer programming. Synthesis and analysis of typical engineering problems.
135. **Engineering Analysis I (3:3:0)**. The profession of engineering and its relation to energy, materials, resources, computers, communication and control. Basic computer programming. Synthesis and analysis of typical engineering problems.
2351. **Computational Techniques (3:3:0)**. An introductory course in computer programming for students in mathematically oriented fields. History of computers; organization and components; FORTRAN language and algorithmic processes; prepares the student for use of Computer Center facilities.
2352. **Introduction to Computer Programming (3:3:0)**. Similar to EA&D 2351 except that the course emphasizes the non-mathematical approach.

FOR UNDERGRADUATES AND GRADUATES

4313. **Variational Methods (3:3:0)**. Prerequisite: MATH 335. Variational and optimal methods in selected engineering topics. Stability and steady-state criteria. Formulation and solution

- of physical problems by variational techniques including exact methods (Euler-Lagrange equations) and approximate methods (Rayleigh-Ritz method and dynamic programming).
4331. **Special Problems in Engineering Analysis and Design (3:3:0).** Prerequisite: Instructor's consent. Individual studies in engineering analysis and design. May be repeated.
4333. **Special Problems in Computer Science (3:3:0).** Prerequisite: MATH 335 and senior standing. Individual studies in computer technology in special areas. May be repeated.
- 4341, 4342. **Digital Computations I, II (3:3:0 each).** Prerequisite: EA&D 124, MATH 335. Application of numerical analysis to solution of linear and nonlinear engineering systems problems. The approximation problem applied to engineering systems. Matrix methods in engineering.
4343. **Analog Computations (3:2:3).** Prerequisite: MATH 335, EA&D 135. Analysis of selected engineering problems using the analog computer. Auxiliary devices used with analog computer.
4347. **Engineering Applications of Linear Programming (3:2:2).** Prerequisite: EA&D 4342. Elements of linear programming. Application to warehousing, transportation, network flow and other engineering problems.
4353. **Computer Programming (3:3:0).** Prerequisite: EA&D 2351 or 2352. Concept and properties of algorithms, language, and describing algorithms, machine representation of numbers and characters, efficient procedures, data storage, overlays. Students will complete advanced programming projects.
4354. **Problem Oriented Computer Languages (3:3:0).** Prerequisite: EA&D 2351 or 2352. Language structure; introduction to COBOL, ALGOL, and other languages, such as PL/1, SIMSCRIPT, IPL-V, etc. Stress placed upon the use of the computer as a problem-solving device.
4355. **Computer Applications to Numerical Methods (3:3:0).** Prerequisite: EA&D 4353. Computer programming applied to numerical error, significant digit arithmetic procedures, classes of error, expression evaluation; solution of non-linear expressions, interpolation, systems of equations; Newton's method, Euler's method, Runge-Kutta.

FOR GRADUATES

5313. **Field Theory (3:3:0).** Prerequisite: MATH 335. Application of partial-differential equations and related methods to generalized field problems selected from the areas of electromagnetism, heat transfer, elasticity, fluid mechanics, and vibrations.
5314. **Analysis of Engineering Systems I (3:3:0).** Prerequisite: MATH 335 or its equivalent and consent of instructor. Analysis of linear and non-linear engineering systems through transform methods and series solutions.
5315. **Analysis of Engineering Systems II (3:3:0).** Prerequisite: EA&D 5314 or consent of instructor. Continuation of analysis of linear and non-linear engineering systems through partial differential equations. Matrix methods and finite differences.
5331. **Special Problems in Advanced Engineering Analysis and Design (3:3:0).** Prerequisite: Graduate standing. Individual studies in advanced applied engineering analysis and design. May be repeated.
5333. **Special Problems in Advanced Computer Science and Technology (3:3:0).** Prerequisite: Graduate standing. Individual studies in advanced computer science and technology. May be repeated.
5341. **Dynamic Programming (3:2:2).** Prerequisite: EA&D 4342. Basic concepts of dynamic programming and its applications to systems analysis; allocation and scheduling processes; Markovian decision processes.
5342. **Applications of Topological Methods (3:2:3).** Prerequisite: Graduate standing. Linear graphs for applied transportation and network flow problems. Minimal cost flow; multiterminal maximal flow. The application of topology in engineering problems.
5351. **Computer Logic Design and Switching Theory (3:3:0).** Prerequisite: EA&D 4353. Symbolic logic and Boolean algebra for the description and analysis of switching circuits; simplification of switching circuits through analysis; error detection and correction techniques, basic sequential circuits; digital systems design principles.
5352. **Computer Systems Organization and Programming I (3:3:0).** Prerequisite: EA&D 4353. Basic machine language programming; subroutines; data packing; code optimization; indexing; indirect addressing; input-output; macros; interpreters; assembly systems.
5353. **Computer Systems Organization and Programming II (3:3:0).** Prerequisite: EA&D 5352. Compilers; push down stacks; control of input-output; data storage; paging; multiprocessing; multiprocessing; efficient use of storage; multilevel backing store.
5354. **Simulation Techniques (3:3:0).** Prerequisite: EA&D 4353. Computer simulation utilizing logical, numerical, and Monte Carlo modeling to represent systems; system status representation and modification; collection and analysis of data; special languages such as GPSS III, SIMULA, SIMSCRIPT.
5355. **Heuristic Techniques (3:3:0).** Prerequisite: EA&D 5354. Distinction between heuristic and algorithmic methods; justification for heuristic approach; mathematical intuition; current research projects. Term project required.
5356. **Formal Computer Language (3:3:0).** Prerequisite: EA&D 5353. Mega languages; languages and grammars used as primitive models of material languages; properties of formal languages; syntactical analysis and compilation.
5357. **Information Retrieval I (3:3:0).** Prerequisite: EA&D 4353. Coding; storage; classification; automatic retrieval; error analysis and correction; Key variants; multikey files; searching strategy; indexing lattices; system performance measurement.
5358. **Introduction to Artificial Intelligence (3:3:0).** Prerequisite: EA&D 4353. Theories and techniques necessary to simulate and study goal oriented behavior of natural or artificial systems; induction process and hypothesis formulation; learning and adaptive systems; pattern recognition; generalized problem solving.
5359. **Statistical Computer Techniques (3:3:0).** Prerequisite: Consent of instructor. The development and use of statistical and mathematical algorithms; emphasis on application and problem-solving techniques.

Engineering Physics

Department of Physics, School of Arts and Sciences. The curriculum leading to the degree of Bachelor of Science in Engineering Physics is pri-

marily one of engineering science and is administered by the Department of Physics in the School of Arts and Sciences and by the School of Engineering. See the section on the School of Arts and Sciences for a description of the department and its course offerings.

Engineering Physics Curriculum.

FIRST YEAR*			
Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	E GR 136, Engr. Graphics	3
EA&D 135, Engr. Anal. I	3	PHYS 143, Prin. of Phys. I	4
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
15**		16**	
SECOND YEAR			
Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	MATH 335, Higher Math. for Engrs. & Scis. I	3
ENG 132, Coll. Rhet.	3	PHYS 242, Prin. of Physics III	4
PHYS 241, Prin. of Physics II	4	E E 234, Electronics Instr.	3
E E 233, Elect. Sys. Anal.	3	C E 331, Mech. of Solids	3
C E 233, Statics	3	Elective (Humanity)	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
16**		16**	
SUMMER SESSION			
First Term		Second Term	
PHYS 335, Elect. & Mag.	3	PHYS 336, Elect. & Mag.	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
6		6	
THIRD YEAR			
Fall		Spring	
MATH 336, Higher Math. for Engrs. & Scis. II	3	PHYS 341, Electronics	4
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
PHYS 434, Mechanics	3	PHYS 435, Mechanics	3
M E 3321, Engr. Thermo.	3	CH E 330, Engr. Matl. Sci.	3
Elective	3	Elective	3
15		16	
FOURTH YEAR			
Fall		Spring	
MATH 3318, Finite Math. Structures	3	MATH 434, Advanced Calc.	3
PHYS 437, Quantum Mech.	3	PHYS 313, Nuclear Phys. Lab.	1
M E 4314, Fluid Dynamics	3	PHYS 338, Intro. to Nuc. Phys.	3
E E 4311, Analog & Digital Comp.	3	M E 4315, Heat & Mass Trans.	3
Elective	3	E E 4353, Feedback Contr. Sys.	3
15		Elective	3
		16	

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—137.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

Courses in Engineering Physics. See course listings of Physics Department in School of Arts and Sciences.

Department of Industrial Engineering

This department supervises the following degree programs: INDUSTRIAL ENGINEERING, *Bachelor of Science in Industrial Engineering*, *Master of Science in Industrial Engineering*, *Doctor of Philosophy*. The undergraduate degree requirements appear in the accompanying curriculum table. The curriculum is designed to equip the student for professional pursuits in the analysis and design of man-machine work systems. A student who receives a grade of D in more than one advanced course will be required to repeat it.

Industrial Engineering Curriculum.

FIRST YEAR*			
Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
EA&D 135, Engr. Anal. I	3	E GR 136, Engr. Graphics	3
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
15**		15**	

SECOND YEAR

Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	4	PHYS 241, Prin. of Physics II	4
PHYS 143, Prin. of Physics I	3	EE 234, Elect. Instr.	3
EE 233, Elec. Sys. Anal.	3	MATH 335, Higher Math. for Engrs. & Scis. I	3
ECO 235, Prin. of Eco.	3	IE 3311, Prin. of Indus. Engr. I	3
CH E 330, Engr. Matl. Sci. or M E 3341, Matls. I	3	MATH 3318, Finite Math. Struct. P.E., Band, or Basic ROTC	3
P.E., Band, or Basic ROTC			
	16**		16**

THIRD YEAR

Fall		Spring	
IE 3321, Prin. of Indus. Engr. II	3	IE 3331, Work Anal. & Des. I	3
IE 3315, Indus. Statistics I	3	IE 3325, Indus. Stat. II	3
CE 233, Statics	3	IE 417, Indus. Stat. Lab.	1
ME 3321, Engr. Thermo.	3	CE 332, Dynamics or	3
ACCT 231, Indus. Acct. for Engrs.	3	CE 3311, Mech. of Solids	3
	15	Electives	6
			16

SUMMER SESSION

First Term		Second Term	
IE 3341, Work Control I	3	IE 3334, Work Anal. & Des. II	3
Elective (Humanity)	3	GOVT 231, Amer. Govt., Org.	3
	6		6

FOURTH YEAR

Fall		Spring	
IE 4221, Spec. Prob. in Indus. Engr.	2	IE 4361, Indus. Engr. Des.	3
IE 3351, Prod. Des. I	3	IE 4334, Work. Anal. & Des. III	3
HIST 231, Hist. of U.S. to 1877	3	Elective (Technical)	6
Elective (Technical)	3	HIST 232, Hist. of U.S. since 1877	3
GOVT 232, Amer. Govt., Funct.	3		
	14		15

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—134.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

Courses in Industrial Engineering.

FOR UNDERGRADUATES

321. Computer Programming Techniques (2:2:0). Prerequisite: Instructor's consent. Programming techniques for digital and analog computers.
332. Industrial Organization and Management (3:3:0). Prerequisite: Nonmajor student and instructor's consent. Modern manufacturing management. Forms of ownership, financial sources; organization charts; plant location and layout; design of manufacturing processes; use of work measurement in management field; principles of quality, production, and inventory control; wage and salary policies.
335. Safety Engineering (3:3:0). Prerequisite: Junior standing in engineering or business management. Principles of safety engineering as applied to industrial situations. Costs of accidents, accident prevention methods, industrial safety programs, frequency and severity rates, protective equipment, jigs and fixtures, accident investigations and reports, student reports on related safety subjects.
337. Production Planning and Control (3:3:0). Prerequisite: IE 3311 or equivalent. Control functions; types of production and control; forecasting and estimating; initiating production control; flow control; block and load control. Forms and communications systems. Value of production control. Linear programming applications to production control.
338. Elements of Methods Analysis (3:2:3). Prerequisite: Nonmajor student and instructor's consent. Science and work, the work system, work simplification, operation analysis, forms control and design. Methods improvement and principles of effective work. Survey of work measurement, work sampling, and inventory control. Applications to many areas, such as business concerns, the home, the farm, the hospital, etc.
3311. Principles of Industrial Engineering I (3:3:0). Prerequisite: MATH 3318. Consideration of the organization through systems approach. Management objectives, decision theory, "model" formulation. Introduction to operations research techniques.
3315. Industrial Statistics I (3:3:0). Prerequisite: MATH 232. Elements of industrial statistics; descriptive statistics, probability, and quality control.
3321. Principles of Industrial Engineering II (3:3:0). Prerequisite: IE 3311 and 3315. Continuation of operations research techniques. Principles and theories of quantitative methods for analysis of work systems.
3325. Industrial Statistics II (3:3:0). Prerequisite: IE 3315 or equivalent. Statistical inference techniques and applications to work systems.
3331. Work Analysis and Design I (3:2:3). Prerequisite: IE 3315 and 3321. Principles and techniques of analysis of work measurement, engineering economy and work flow, with applications of design for better work systems. Emphasis on methods and measurement.
3334. Work Analysis and Design II (3:3:0). Prerequisite: IE 3331. Emphasis on engineering economy analysis.
3341. Work Control I (3:3:0). Prerequisite: IE 3331. Basic designs of work control systems. Emphasis on forecasting; material and product control.
3351. Production Design I (3:2:3). Prerequisite: IE 3331 and CH E 330 or equivalent. Elements of machines and manufacturing processes, metal removal theory; principles of machine tool design; introduction to automation principles and design.

FOR UNDERGRADUATES AND GRADUATES

417. **Industrial Statistics Problem Laboratory (1:0:3).** Prerequisite: Parallel registration in IE 3315, 3325, or 5317, and consent of instructor. Experimental study of statistical techniques. Problem design and data analysis. May be repeated in different areas.
421. **Materials Handling (2:2:0).** Prerequisite: IE 338 or 3331. A study of various types of materials handling equipment, such as trucks, elevators, conveyors, etc., and their application to various materials handling problems. Students desiring a 3-hour course in materials handling may enroll in IE 4121 for additional hour of credit.
439. **Analysis of Industrial Operations (3:3:0).** Prerequisite: IE 3315 or equivalent. Introduction to operations research techniques. Study of the applications of quantitative methods for analysis of industrial operating problems.
4121. **Industrial Engineering Seminar (1:1:0).** Prerequisite: Advanced standing and departmental approval. Individual study of engineering problems of value to the student. May be repeated.
4221. **Special Problems in Industrial Engineering (2:2:0).** Prerequisite: Industrial engineering seniors. Practical solutions to a variety of problems which the industrial engineer may encounter in his work; plant layout; production planning; engineering economy; methods improvements; materials handling; etc.
4331. **Individual Studies in Industrial Engineering (3:3:0).** Prerequisite: Advanced standing and departmental approval. May be repeated.
4332. **Special Experimental Problems in Industrial Engineering (3:0:9).** Prerequisite: Advanced standing and departmental approval. May be repeated.
4334. **Work Analysis and Design III (3:2:3).** Prerequisite: IE 3334. Emphasis on work flow design.
4341. **Work Control II (3:3:0).** Prerequisite: IE 3341. Emphasis on inventory theory, "model" formulation of work control systems, etc.
4351. **Production Design II (3:2:3).** Prerequisite: IE 3351. Emphasis on automation and automatic controls.
4361. **Industrial Engineering Design (3:3:0).** Prerequisite: Graduating industrial engineering seniors. Design of a complete operational organization, with emphasis on the application of theories covered in previous course work.

FOR GRADUATES

- 512, 513. **Seminar (1:1:0 each).** Prerequisite: Graduate standing or instructor's consent. Discussion will concern present research conducted in industrial engineering. Other special topics will also be considered. May be repeated.
532. **Standard Data Systems (3:2:3).** Prerequisite: Graduate standing or instructor's consent. Concepts of standard time data and standard data systems, consideration of company, commercial, and statistical standard data systems; use of multivariable charts and nomographs.
535. **Engineering Controls for Industrial Safety (3:3:0).** Prerequisite: Graduate standing or instructor's consent. Design of the industrial safety program under widely variant conditions through proper combination of accident control activities. Workmen's compensation, minimum safety standards legislation, health hazards in industry. Statistical measurements of safety performances. Analytical studies of fire prevention techniques.
538. **Engineering Aspects of Wage Policies (3:3:0).** Prerequisite: Graduate standing or instructor's consent. Engineering aspects of wage problems based on wage incentives, plans, job analysis, job descriptions, merit rating, and job evaluation.
- 5111, 5212, 5213, 5214. **Industrial Engineering Case Analysis (1:1:0, 2:2:0).** Prerequisite: Graduate standing or instructor's consent. Special studies and investigations in the application of various industrial engineering techniques.
- 5301, 5302, 5303. **Advanced Work Analysis and Design (3:2:3 each).** Prerequisite: Graduate standing or instructor's consent. Industrial biomechanics, kinesiology and cybernetics with emphasis on the design, evaluation and monitoring of man-task systems for optimal operation and prevention of work stress. Advanced work study procedures, validity and design of predetermined time systems, link analysis for static and dynamic work, physiological monitoring, biomechanical quality occurrence, etc., applied to work systems.
- 5307, 5308. **Advanced Production Control (3:3:0 each).** Prerequisite: Graduate standing or instructor's consent. Modern practices and theory of making optimal decisions concerning production, inventories, and human resources. The use of the analytical and mathematical approach to solve complicated decision problems.
- 5311, 5312. **Analysis Techniques for Management (3:3:0 each).** Prerequisite: Graduate standing or instructor's consent. Concepts and principles of operations research. Mathematical and statistical tools which aid management decisions; applications and case studies.
- 5314, 5315. **Analysis Techniques for Work Systems (3:3:0 each).** Prerequisite: Graduate standing or instructor's consent. Concepts and principles of queuing theory, dynamic programming, simulation, and other mathematical and statistical tools for the analysis and design of work systems; applications and case studies.
5316. **Statistical Reliability Analysis (3:3:0).** Prerequisite: 3 hours of statistics or instructor's consent. The role of probability and statistics in reliability analysis; statistical models for fatigue and failure, with emphasis on exponential, Weibull, Gamma, and extreme-value distributions. Design, analysis, and interpretation of multifactor reliability experiments; increased severity testing; improved reliability through redundancy and maintenance; application to component and systems reliability.
5317. **Advanced Industrial Statistics (3:3:0).** Prerequisite: 6 hours of statistics or instructor's consent. Analysis of variance, multiple correlation, analysis of covariance, design of experiments, randomized blocks and Latin square, response-surface analysis, and determination of optimum conditions.
5318. **Selected Topics in Advanced Statistics (3:3:0).** Prerequisite: 6 hours of statistics or instructor's consent. Selected topics chosen from such areas as nonparametric statistical methods; sequential analysis; multivariate analysis; etc. May be repeated in different areas.
- 5321, 5322. **Decision Theory and Management Science (3:3:0 each).** Prerequisite: Graduate standing or instructor's consent. Concepts and principles of decision models; theory and practice of management planning and administrative control; decision theory, cybernetics and management science.

5331. **Theoretical Studies in Advanced Industrial Engineering Topics.** (3:3:0). Prerequisite: Graduate standing and departmental approval. Individual theoretical study of advanced topics selected on the basis of departmental recommendation. May be repeated.
5332. **Experimental Investigation in Advanced Industrial Engineering Topics** (3:0:9). Prerequisite: Graduate standing and departmental approval. Individual experimental study of advanced topics selected on the basis of departmental recommendation. May be repeated.
- 5351, 5352. **Advanced Production Design** (3:3:0 each). Prerequisite: IE 4351 and MATH 335. A continuation of IE 4351, with emphasis on design and construction for automation and automatic controls.
- 5361, 5362. **Dynamics of Engineering Economy** (3:3:0 each). Prerequisite: Graduate standing or instructor's consent. A continuation of engineering economy studies with emphasis on utility, price changes, investment, growth, replacement and taxes. Quantitative analysis of problems involving risk and uncertainty.
630. **Master's Report** (3).
631. **Master's Thesis** (3). Enrollment required at least twice.
- 731, 732. **Research** (3 each).
831. **Doctor's Dissertation** (3). Enrollment required at least four times.

Courses in Engineering Graphics.

Engineering graphics courses are required for all engineering students to familiarize them with the graphic language of the engineer.

FOR UNDERGRADUATES

121. **Engineering Graphics I** (2:1:3). Introduction to space relationships; fundamentals of shape description, free-hand sketching, engineering geometry, pictorial presentations of ideas, and principles of size description. Stress is given to the essentials of sketching and drafting in conveying ideas in the graphic language of the engineer.
122. **Engineering Graphics II** (2:1:3). Prerequisite: EGR 121. Graphical presentation of data, fundamentals of nomography, advanced space relationships, concepts of surface intersections and developments.
136. **Engineering Graphics** (3:1:6). Introduction to space relationships; principles of size and shape pertinent to engineering, free-hand sketching, orthographics, pictorals, graphical presentation of data, engineering geometry and nomography.

Department of Mechanical Engineering

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 undergraduate curriculum in the table below allows for an emphasis in either materials engineering or in thermal engineering during the senior year.

Mechanical Engineering Curriculum.

FIRST YEAR*

Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
EA&D 135, Engr. Anal. I	3	EGR 136, Engr. Graphics	3
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
15**		15**	

SECOND YEAR

Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	MATH 335, Higher Math. for Engrs. & Scits. I	3
PHYS 143, Prin. of Physics I	4	PHYS 241, Prin. of Physics II	4
EE 233, Elect. Sys. Anal.	3	EE 234, Electronics Instr.	3
ME 3314, Mechanisms	3	CE 233, Statics	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
16**		16**	

THIRD YEAR

Fall		Spring	
CE 332, Dynamics	3	ME 3315, Stress Analysis	3
ME 3321, Engr. Thermo. I	3	ME 3318, Mech. Engr. Instr.	3
ME 3341, Materials I	3	ME 3342, Materials II	3
ME 3316, Intro. to Mech. Sys.	3	Elective (Humanity)	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
15		15	

SUMMER SESSION

First Term		Second Term	
ME 4312, Mech. Engr. Lab. I	3	ME 4313, Mech. Engr. Lab. II	3
ME 4335, Design I	3	ME 4336, Design II	3
6		6	

FOURTH YEAR

Fall		Spring	
M E 4314, Fluid Dynamics	3	M E 4315, Heat & Mass Transfer or	
M E 4333, Thermal Systems I	3	M E 4334, Thermal Sys. II	3
M E 4316, Dynamics	3	M E 4331, Special Problems	3
M E 4341, Materials III	3	M E 4334, Thermal Sys. II or	
M E 4342, Metal Physics or		M E 4346, X-Ray Metal.	3
Elective	3	M E 4321, Engr. Thermo. II or	
	15	M.E. 4345, Metal. Rate React.	3
		Elective	3
			15

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—134.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

Courses in Mechanical Engineering.

FOR UNDERGRADUATES

3314. **Mechanisms (3:3:0)**. Corequisite: MATH 235. Kinematic analysis and synthesis of cams, gears, linkages.
3315. **Stress Analysis (3:3:0)**. Prerequisite: C E 233, MATH 335. Elastic behavior in tension, torsion, bending; stability, plane strain and plane stress.
3316. **Mechanical Response Theory (3:3:0)**. Prerequisite: MATH 335. A unified introductory treatment of analytical and numerical solution techniques for mechanical systems.
3318. **Mechanical Engineering Instrumentation (3:2:3)**. Prerequisite: E E 234. Calibration techniques and measurements with electronic, optical, and mechanical instrumentation.
3321. **Engineering Thermodynamics I (3:3:0)**. Prerequisite: PHYS 241, MATH 335. Concepts of thermodynamics, properties, irreversibility, applications to systems.
3341. **Materials I (3:3:0)**. Corequisite: M E 3321. Fundamental thermodynamic and chemical nature of the structure and properties of materials.
3342. **Materials II (3:2:3)**. Prerequisite: M E 3341. Mechanical properties and behavior of engineering materials based on their metallurgical constitution.

FOR UNDERGRADUATES AND GRADUATES

4121. **Mechanical Engineering Seminar (1:1:0)**. Prerequisite: Advanced standing and approval of departmental adviser. Individual study of engineering problems. May be repeated for credit in different areas.
- 4312, 4313. **Mechanical Engineering Laboratory I, II (3:2:3 each)**. Prerequisite: M E 3318. Experimental and developmental testing of basic mechanical equipment.
4314. **Fluid Dynamics (3:3:0)**. Prerequisite: M E 3321. Basic fluid and fluid flow concepts, fluid resistance, compressible flow, and hydrodynamic theory.
4315. **Heat and Mass Transfer (3:3:0)**. Prerequisite: M E 3321. Heat transfer by conduction, convection, and radiation. Mass transfer in liquids, vapors, and gases.
4316. **Dynamics (3:3:0)**. Prerequisite: MATH 335, C E 332. Newtonian dynamics of rigid bodies, Lagrange's equations, theory of small vibrations.
4321. **Engineering Thermodynamics II (3:3:0)**. Prerequisite: M E 3321, MATH 335. Kinetic theory, basic chemical thermodynamics, non-equilibrium thermodynamics, introduction to statistical mechanics.
4331. **Special Problems in Mechanical Engineering (3:3:0)**. Prerequisite: Advanced undergraduate standing. Individual study in advanced engineering areas. May be repeated for credit in different areas.
4332. **Special Experimental Problems in Mechanical Engineering (3:0:9)**. Prerequisite: Advanced undergraduate standing. Individual experimental study in advanced engineering areas. May be repeated for credit in different areas.
4333. **Thermal Systems I (3:3:0)**. Prerequisite: M E 3321. Analysis of thermal power and environmental system components; steady state behavior of such systems.
4334. **Thermal Systems II (3:3:0)**. Prerequisite: M E 4333. Analysis and simulation of control of thermal power and environmental systems.
4335. **Design I (3:3:0)**. Prerequisite: M E 3314, 3315. Analysis of stresses and deformations in and functions of machine elements.
4336. **Design II (3:3:0)**. Prerequisite: M E 4335. Product analysis, design, development, and evaluation.
4341. **Materials III (3:3:0)**. Prerequisite: M E 3341. Methods of forming and fabrication, their effects on materials, and the suitability of materials for various processes.
4342. **Metal Physics (3:3:0)**. Prerequisite: M E 3321. Heterogeneous equilibria, molecular structures, free energy, thermochemistry, solutions.
4344. **Thermal Transformations in Solids (3:2:3)**. Prerequisite: M E 3342. Applications of the principles of modifying the mechanical properties of metal alloys by thermally induced transformations.
4345. **Metallurgical Rate Reactions (3:3:0)**. Prerequisite: M E 3342. Kinetics of heterogeneous reactions; diffusion, corrosion, oxidation, and creep.
4346. **X-Ray Metallography (3:2:3)**. Prerequisite: M E 3342. Fundamentals of X-ray diffraction and emission methods applied to the study of the structure of metals.

FOR GRADUATES

5313. **Dynamics III (3:3:0)**. Prerequisite: MATH 335, C E 332. Wave transmission in elastic media. Summer.
5314. **Stress Analysis I (3:2:3)**. Prerequisite: MATH 335, M E 3315. Theory and application of photoelasticity to static and dynamic stress analysis. Spring.
5316. **Mechanical Vibrations I (3:3:0)**. Prerequisite: MATH 335, C E 332. Free and forced vibrations of linear and non-linear lumped parameter systems. Fall.
5317. **Mechanical Vibrations II (3:3:0)**. Prerequisite: MATH 335, C E 332. Free and forced vibration of continuous, elastic structures. Spring.
5321. **Thermodynamics I (3:3:0)**. Prerequisite: M E 4321. Quantum mechanics, information theory, intermolecular forces. Spring.

5322. **Thermodynamics II (3:3:0)**. Prerequisite: M E 5323. Microscopic-scale analysis of non-equilibrium phenomena, irreversible thermodynamics. Not offered 1968-69.
5323. **Thermodynamics III (3:3:0)**. Prerequisite: M E 4321. Non-equilibrium states and irreversible processes; description of systems in non-equilibrium states and analyses of transient and steady irreversible processes from the macroscopic viewpoint. Fall.
5324. **Heat Transmission I (3:3:0)**. Prerequisite: M E 4314 or 4315. The fundamental principles of heat transmission by conduction; boundary value problems, separation; transform, integral, and numerical methods. Fall.
5325. **Heat Transmission II (3:3:0)**. Prerequisite: M E 4314 or 4315. Fundamental principles of heat transmission by convection; theoretical and empirical methods of analysis. Spring.
5326. **Heat Transmission III (3:3:0)**. Prerequisite: M E 4315. Fundamental principles of heat transmission by radiation; grey surfaces; network methods, absorbing media. Summer.
5327. **Aerodynamics I (3:3:0)**. Prerequisite: M E 4314. Gas dynamics, external compressible flow, wave phenomena, potential theory. Spring.
5328. **Aerodynamics II (3:3:0)**. Prerequisite: M E 4314. Boundary layer theory, viscous and turbulent flows, separation, thermal boundary layers. Fall.
5329. **Aerodynamics III (3:3:0)**. Prerequisite: M E 5327 or 5328. Non-equilibrium gas dynamics, boundary layer interactions, aerodynamic heating, aerothermochemistry. Not offered 1968-69.
5331. **Theoretical Studies in Advanced Topics (3:3:0)**. Prerequisite: Graduate standing. Individual theoretical study of advanced topics selected on the basis of the departmental adviser's recommendation. May be repeated for credit in different areas.
5332. **Experimental Studies in Advanced Topics (3:1:6)**. Prerequisite: Graduate standing. Individual experimental study of advanced topics selected on the basis of the departmental adviser's recommendation. May be repeated for credit in different areas.
5333. **Design I (3:3:0)**. Prerequisite: M E 5325. Synthesis of thermal systems, design and off-design characteristics, transient behavior of thermal systems. Spring.
5341. **Metallurgy I (3:3:0)**. Prerequisite: M E 3341. Dislocations in metals; diffusion; phase transformations and precipitation; thermal, electronic, and structural properties of metals. Fall.
5342. **Metallurgy II (3:3:0)**. Prerequisite: M E 3341. Corrosion and corrosion control, behavior of metals and alloys at elevated temperatures, field applications. Fall.
5343. **Thermodynamics of Solids (3:3:0)**. Prerequisite: M E 3341. Physical chemistry and chemical thermodynamics of metals and metal alloys; utilization of metals. Spring.
5351. **Boiling Heat Transfer (3:3:0)**. Prerequisite: M E 5324 or 5325. Bubble dynamics; nucleate, transitional and film boiling; critical heat fluxes, flow in boiling systems. Spring.
630. **Master's Report (3)**.
631. **Master's Thesis (3)**. Enrollment required at least twice.
- 731, 732. **Research (3 each)**. May be repeated for credit.
831. **Doctor's Dissertation (3)**. Enrollment required at least four times.

Department of Petroleum Engineering

This department supervises the following degree program: **PETROLEUM ENGINEERING, Bachelor of Science in Petroleum Engineering**. The curriculum includes basic engineering courses followed by specialized work essential to the practice of the profession of petroleum engineering. The curriculum appears in the table below.

Petroleum Engineering Curriculum.

FIRST YEAR*			
Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
EA&D 135, Engr. Anal. I	3	EGR 136, Engr. Graphics	3
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
<hr/>		<hr/>	
15**		15**	
SECOND YEAR			
Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	PHYS 241, Prin. of Physics II	4
PHYS 143, Prin. of Physics I	4	GEOL 144, Hist. Geology	4
GEOL 143, Phys. Geology	4	MATH 335, Higher Math. for	
GOVT 231, Amer. Govt., Org.	3	Engrs. & Scis. I	3
CH E 330, Eng. Matl. Sci.	3	C E 233, Statics	3
P.E., Band, or Basic ROTC		GOVT 232, Amer. Govt., Funct.	3
		P.E., Band, or Basic ROTC	
<hr/>		<hr/>	
17**		17**	
SUMMER SESSION			
First Term		Second Term	
C E 332, Dynamics	3	C E 3311, Mech. of Solids	3
	<hr/>	M E 3321, Engr. Thermo.	3
	3		<hr/>

THIRD YEAR

Fall		Spring	
PETR 331, Petroleum Development	3	PETR 333, Petrol. Prod. Meth.	3
PETR 322, Rot. Drill. Fluids	2	PETR 320, Well Logging Meth.	2
E E 233, Elect. Sys. Anal.	3	PETR 314, Production Lab.	1
CHEM 343, Intro. Phys. Chem.	4	E E 234, Electronic Instr.	3
MATH 336, Higher Math. for Engrs. & Scits. II	3	C E 3351, Mech. of Fluids	3
		C E 3151, Mech. of Fluids Lab.	1
		Elective (Humanity)	3
	15		16

FOURTH YEAR

Fall		Spring	
PETR 4121, Petrol. Engr. Seminar	1	PETR 4121, Petrol. Engr. Seminar	1
PETR 433, Reservoir Engr.	3	PETR 435, Adv. Nat. Gas Engr.	3
PETR 434, Nat. Gas Engr.	3	PETR 413, Nat. Gas Lab.	1
PETR 416, Reservoir Engr. Lab.	1	PETR 436, Adv. Res. Engr.	3
GEOL 332, Struct. Geology	3	PETR 420, Petrol. Prop. Eval. & Mgt.	2
HIST 231, Hist. of U.S. to 1877	3	BLAW 3313, Oil & Gas Law	3
Elective	3	HIST 232, Hist. of U.S. since 1877	3
	17		16

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—137.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

Courses in Petroleum Engineering.

FOR UNDERGRADUATES

314. **Production Laboratory (1:0:3).** Prerequisite: Enrollment in PETR 333. Experiments in reservoir characteristics, core analyses, oil dehydration, corrosion, lease operation, and pumping well characteristics.
320. **Well Logging Methods (2:2:0).** Prerequisite: PETR 331 and PHYS 241. Well-logging theory and techniques as applied to quantitative formation analysis. Field examples and problems.
321. **Phase Behavior (2:2:0).** Prerequisite: PHYS 241 and enrollment in M E 3321. Phase behavior of multiple-component hydrocarbon systems. Applications.
322. **Rotary Drilling Fluids (2:1:3).** Prerequisite: Enrollment in PETR 331. Characteristics of drilling fluid. Control and alteration of fluid characteristics. Effects on drilling process.
330. **Introduction to Petroleum Industry (3:3:0).** Prerequisite: Junior standing. A general study of petroleum production technology for nonmajors.
331. **Petroleum Development Methods (3:3:0).** Prerequisite: Junior standing. Petroleum and basic rock properties. Rotary drilling, casing, cementing and oil well completion practices.
333. **Petroleum Production Methods (3:3:0).** Prerequisite: PETR 331. Oil well stimulation practices. Producing practices to include flowing, gas lift, hydraulic and sucker rod pumping systems.

FOR UNDERGRADUATES AND GRADUATES

413. **Natural Gas Laboratory (1:0:3).** Prerequisite: Registration in PETR 434 or 435. Natural gas analysis and testing; flow-metering devices; regulation and control devices; and natural gasoline techniques.
416. **Reservoir Engineering Laboratory (1:0:3).** Prerequisite: PETR 433. Experimental work in fluid flow through porous media relating basic parameters to the reservoir system.
420. **Petroleum Property Evaluation and Management (2:1:3).** Prerequisite: PETR 433. Economic, physical and analytical evaluation of hydrocarbon producing properties, emphasizing relative worth of investments based on engineering judgement, using actual oil properties.
430. **Special Natural Gas and Production Problems (3:3:0).** Prerequisite: PETR 333. Production problems including gas-oil ratio control, water control, decline curves, formation damage due to well completion, and well workovers.
433. **Reservoir Engineering (3:3:0).** Prerequisite: PETR 333. Fluid flow in porous media including unsteady-state flow; reservoir energy and producing mechanisms; application of material balance in reservoir performance calculations.
434. **Natural Gas Engineering (3:3:0).** Prerequisite: PETR 333. The properties and behavior of hydrocarbons and related systems, and the associated thermodynamics.
435. **Advanced Natural Gas Engineering (3:3:0).** Prerequisite: PETR 434. The production of natural gas and condensate reservoirs; processing, transportation, distribution, and measurement of natural gas and its derivatives.
436. **Advanced Reservoir Engineering (3:3:0).** Prerequisite: PETR 433. Frontal-advance theory and application; mechanics of secondary recovery processes; application to reservoir performance and analysis.
4121. **Petroleum Engineering Seminar (1:1:0).** Prerequisite: Advanced standing. Individual study of engineering problems of special interest and value to the student. May be repeated for credit.
4331. **Special Problems in Petroleum Engineering (3:3:0).** Prerequisite: Advanced standing. Individual studies in advanced engineering areas of special interests. May be repeated for credit.
4332. **Special Experimental Problems in Petroleum Engineering (3:0:9).** Prerequisite: Advanced standing. Individual experimental studies in current problems in advanced engineering technology of special interest. May be repeated for credit.
5121. **Graduate Seminar (1:1:0).** Required for petroleum engineering graduate students. May be repeated for credit.
5331. **Special Problems in Petroleum Engineering (3:3:0).** Prerequisite: Graduate standing and approval of departmental adviser. Individual theoretical study of selected advanced topics. May be repeated for credit in different areas.

5332. **Experimental Studies in Petroleum Engineering (3:1:6).** Prerequisite: Graduate standing and approval of departmental adviser. Individual experimental study of selected advanced topics. May be repeated for credit in different areas.
5343. **Advanced Studies in Fluid Flow Through Porous Media (3:3:0).** Prerequisite: Graduate standing. Miscible and immiscible flow; mathematical theory of flow; transient behavior; moving boundary problems; model theory; flow with change in phase.
5353. **Advanced Studies in Reservoir Recovery Processes (3:3:0).** Prerequisite: Graduate standing. Recovery process theory; miscible recovery systems; immiscible recovery systems; thermal and other recovery systems.

Department of Textile Engineering and Textile Research Center

This department supervises the following degree programs: **TEXTILE ENGINEERING, Bachelor of Science in Textile Engineering**; **TEXTILE TECHNOLOGY AND MANAGEMENT, Bachelor of Science in Textile Technology and Management.** Degree requirements appear in the accompanying curriculum tables.

The textile engineering curriculum is recommended for those students desiring advanced study or careers in research, technical design, and technical management, while the textile technology and management curriculum is designed to aid in striking a balance between technological and business management sectors.

Each program contains a nucleus of courses embracing the most fundamental studies of fibers, textile production, finishing and testing, and quality control.

Textile Engineering Curriculum.

FIRST YEAR*

Fall		Spring	
MATH 151, Anal. Geom. & Calc. I	5	MATH 152, Anal. Geom. & Calc. II	5
ENG 131, Coll. Rhet.	3	ENG 132, Coll. Rhet.	3
EGR 136, Engr. Graphics	3	EA&D 135, Engr. Anal. I	3
CHEM 141, Gen. Chem.	4	CHEM 142, Gen. Chem.	4
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
15**		15**	

SECOND YEAR

Fall		Spring	
MATH 235, Anal. Geom. & Calc. III	3	PHYS 241, Prin. of Physics II	4
PHYS 143, Prin. of Physics I	4	EE 234, Electronic Instr.	3
EE 233, Elect. Sys. Anal.	3	MATH 335, Higher Math. for Engrs. & Scis. I	3
TE 231, Fiber Tech. & Micro. I	3	TE 232, Fiber Tech. & Micro. II	3
MATH 3318, Finite Math. Struct.	3	CE 233, Statics	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	
16**		16**	

SUMMER SESSION

First Term		Second Term	
IE 3311, Prin. of Indus. Engr. I	3	IE 3321, Prin. of Indus. Engr. II	3
IE 3315, Indus. Statistics I	3	CH E 330, Engr. Matl. Science	3
6		6	

THIRD YEAR

Fall		Spring	
TE 335, Prin. of Fabric Des., Form & Anal. I	3	TE 336, Prin. of Fabric Des., Form & Anal. II	3
TE 331, Prin. of Fiber Proc. I	3	TE 332, Prin. of Fiber Proc. II	3
CE 332, Dynamics	3	Elective (Humanity)	3
ME 3321, Engr. Thermodynamics	3	CE 3311, Mech. of Solids	3
IE 3331, Work Anal. & Des. I	3	IE 3334, Work Anal. & Des. II	3
15		15	

FOURTH YEAR

Fall		Spring	
TE 433, Engr. Prin. of Text. Fin. I	3	TE 434, Engr. Prin. of Text. Fin. II	3
IE 4334, Work Anal. & Des. III	3	TE 431, Text. Test. & Qual. Contr.	3
HIST 231, Hist. of U.S. to 1877	3	HIST 232, Hist. of U.S. since 1877	3
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
Elective (Technical)	3	ME 4315, Heat & Mass Transfer	3
15		TE 4121, Text. Engr. Seminar	1
		16	

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—135.

* See Alternate Freshman Year.

** Exclusive of P.E., Band, or Basic ROTC.

Textile Technology and Management Curriculum.**FIRST YEAR**

Fall		Spring	
MATH 131, Trigonometry	3	PHYS 141, Gen. Physics	4
MATH 133, Coll. Algebra	3	MKT 246, Intro. to Bus. Stat.	4
EGR 136, Engr. Graphics	3	ENG 132, Coll. Rhet.	3
ENG 131, Coll. Rhet.	3	CHEM 142, Gen. Chem.	4
CHEM 141, Gen. Chem.	4	P.E., Band, or Basic ROTC	

16*

15*

SECOND YEAR

Fall		Spring	
PHYS 142, Gen. Phys.	4	ECO 235, Prin. of Eco.	3
TE 231, Fiber Tech. & Micro. I	3	TE 232, Fiber Tech. & Micro. II	3
ACCT 234, Elem. Acct. I	3	ACCT 235, Elem. Acct. II	3
ENG 233, Tech. Writing	3	CHEM 341, Gen. Org. Chem.	4
GOVT 231, Amer. Govt., Org.	3	GOVT 232, Amer. Govt., Funct.	3
P.E., Band, or Basic ROTC		P.E., Band, or Basic ROTC	

16*

16*

THIRD YEAR

Fall		Spring	
TE 331, Prin. of Fiber Proc. I	3	IE 321, Computer Prog. Tech.	2
TE 335, Prin. of Fabric Des., Form. & Anal. I	3	TE 332, Prin. of Fiber Proc. II	3
MGT 331, Indus. Mgt.	3	TE 336, Prin. of Fabric Des., Form. & Anal. II	3
MKT 332, Prin. of Mkt.	3	MGT 333, Collective Bargaining	3
HIST 231, Hist. of U.S. to 1877	3	SPCH 338, Bus. & Prof. Speech	3
IE 338, Elem. of Meth. Anal.	3	HIST 232, Hist. of U.S. since 1877	3

18

17

FOURTH YEAR

Fall		Spring	
TE 4331, Spec. Prob. in Text. Engr.	3	TE 431, Text. Test. & Qual. Contr.	3
TE 433, Engr. Prin. of Text. Fin. I	3	TE 434, Engr. Prin. of Text. Fin. II	3
BLAW 338, Bus. Law I	3	TE 4332, Spec. Exp. Prob. in Text. Engr.	3
MGT 435, Employee Supervision	3	MGT 431, Job Eval. & Wage Admin.	3
MKT 439, Sales Mgt.	3	BLAW 339, Bus. Law II	3
Elective	3		

18

15

Minimum hours required for graduation, exclusive of P.E., Band, or Basic ROTC—131.

* Exclusive of P.E., Band, or Basic ROTC.

Courses in Textile Engineering.**FOR UNDERGRADUATES**

230. **Applied Textiles (3:3:0).** An introductory study of textile fibers, yarn manufacturing, fabric design, analysis and formation and textile finishing. Not for textile engineers.
231. **Fiber Technology and Microscopy I (3:2:3).** Prerequisite: CHEM 142. Physics and chemistry of polymers; growth marketing and properties of natural fibers; microscopic examination of fibers.
232. **Fiber Technology and Microscopy II (3:2:3).** Prerequisite: TE 231. Polymerization techniques; production and properties of man-made fibers; cross sectioning and fiber identification.
331. **Principles of Fiber Processing I (3:2:3).** Fundamental principles and practices for processing cotton and man-made fibers into yarn. Analysis of machine operations and performance standards.
332. **Principles of Fiber Processing II (3:2:3).** Includes preparation of yarns to meet specific end uses. Correlation of machine performance capabilities of fundamental fiber properties.
335. **Principles of Fabric Formation, Design, and Analysis I (3:1:6).** Prerequisite: TE 232. Theory and practice in designing, forming and analyzing plain and fancy fabrics. Laboratory study and engineering analysis of fabric forming mechanisms.
336. **Principles of Fabric Formation, Design, and Analysis II (3:1:6).** Prerequisite: TE 335. Theory and practice in designing, forming, and analyzing complicated fabric structures for special applications and engineering analysis of mechanisms for fabricating such structures.
431. **Textile Testing and Quality Control (3:2:3).** Instrumentation and test procedures for process control and product performance. Rigorous statistical treatment of test data and preparation of control charts.
433. **Engineering Principles of Textile Finishing I (3:2:3).** Prerequisite: TE 232, 336. Water treatment and waste disposal; textile drying; theory and practice of operations prior to dyeing.
434. **Engineering Principles of Textile Finishing II (3:2:3).** Prerequisite: TE 433. Elementary theory of color measurement; theory and practice in dyeing, printing, and finishing procedures.

FOR UNDERGRADUATES AND GRADUATES

4121. **Textile Engineering Seminar (1:1:0).** Prerequisite: Approval of department chairman. Individual study of engineering problems of special interest. May be repeated for credit.
4331. **Special Problems in Textile Engineering (3:3:0).** Prerequisite: Approval of department chairman. Individual studies in advanced engineering areas of special interest. May be repeated for credit.

4332. **Special Experimental Problems in Textile Engineering (3:0:9).** Prerequisite: Approval of departmental chairman. Individual experimental studies in current problems in advanced engineering technology. May be repeated for credit.

FOR GRADUATES

- 531, 532. **Theory of Color Measurement I and II (3:2:3 each).** Prerequisite: T E 434 or permission of department chairman. Theory of color perception; mathematics of color measurement; theory and practice of color matching.
- 533, 534. **Chemical Analysis of Textile Materials I and II (3:2:3 each).** Prerequisite: T E 232, CHEM 242, 336. Identification of textile fibers and finishes, using microscopic, spectrographic and chromatographic techniques, as well as differential thermal analysis; quantitative analysis of fiber blends.
5331. **Special Problems in Textile Engineering (3:3:0).** Prerequisite: Graduate standing and approval of department chairman. Individual studies in advanced textile engineering or textile finishing.
5332. **Experimental Studies in Textile Engineering (3:0:9).** Prerequisite: Graduate standing and approval of department chairman. Individual laboratory studies in advanced textile engineering or textile finishing.

School of Home Economics

The School of Home Economics was one of the four initial schools of the College when it opened in 1925. Since then this school has continuously revised its program to meet the steadily expanding roles of educated women as homemakers, mothers, citizens, employees, and attractively intelligent persons. Teaching continues to be the most appealing profession for graduates in home economics, although increasing numbers of home economists are being employed in business and government. The demand for qualified home economists is always greater than the supply.

The objectives of the School of Home Economics may be classified under the three headings of education, research, and service, with the three aims overlapping at many points. The two major objectives of the school are the education of women for personal family living and for employment in the field of home economics. Research is carried on to expand the boundaries of knowledge in home and family living and in the professional fields of home economics. An effective program in home economics by its very nature provides a service to the campus and the community.

The School of Home Economics designs its offerings to serve both men and women in three groups: students majoring in home economics in preparation for a career in that field; students registered in other schools of the College who wish training either for homemaking or for supplementing their degree plans; and persons in the area served by the College who wish to take refresher courses in home economics or to work toward an advanced degree.

Course Load. Normally, students in the School of Home Economics carry a load of 16-18 semester hours. No student is permitted to enroll for a program of more than 18 or less than 12 semester hours without 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.

Home Economics Advisory Program. One of the outstanding features of the School of Home Economics at Texas Technological College is its faculty-student advisory program.

Aid to Students. A number of student assistantships are available in home economics providing financial assistance as well as valuable experience to capable students. A student interested in employment of any type should consult with her adviser, the chairman of her department, or the dean.

Selection of a Major. The student should not attempt to make a final selection of her major until she has investigated the programs available. An entering freshman is encouraged to take the beginning course in each of the four areas of home economics: clothing and textiles, food and nutrition, child development and family relations, and home management, as well as a beginning course in art in the School of Arts and Sciences. The required freshman course, Personal Development (CDFR 112), should prove of considerable help to the student in making her decision.

Because of poor schedule planning, failure in one or more courses, or for other reasons, a student in any major program may be required to attend more than the normal eight semesters. Before the close of her junior year, therefore, each student should plan carefully the scheduling of courses needed to fulfill the degree requirements in order to determine her expected date of graduation.

Summary of B.S. Degree Requirements in Selected Options in Home Economics.
REQUIREMENTS INSIDE THE SCHOOL OF HOME ECONOMICS

Requirements in Home Economics	Curriculum Requirements for the Majors in Selected Home Economics Options								
	Interior Design	Clothing and Textiles		Food and Nutrition		General Home Economics	Home Economics Education	Home and Family Life Child Development and Family Relations Option	Home Management Option
Clothing and Textiles	131, 231, 237 9 hrs.	131, 231, 237, 332, 433, 438, 434, 436 24 hours	131, 231, 237, 332, 334, 433 (or 438), 434 plus elective to complete 24 hrs.	131, 231—6 hrs.	131, 231—6 hrs	131, 231, 332, 237—12 hrs.	131, 231, 237, 332—12 hrs.	131, 231—6 hrs.	131, 231, 333, 332—12 hrs.
Food and Nutrition	131, 331, 334 9 hrs.	131, 231 or 331—6 hrs.	131, 334—6 hrs.	131, 231, 320, 321, 331, 334, 439, plus electives to meet ADA requirements	131, 231, 331, 334, 422, 425, 436, plus electives to complete 24 hrs.	131, 331, 334 9 hrs.	131, 331, 334 9 hrs.	131, 334—6 hrs.	131, 331, 334 425—11 hrs.
Home Economics Education	433, 411— 4 hrs.	433, 411— 4 hrs.	433, 411— 4 hrs.	433, 411— 4 hrs.	433, 411— 4 hrs.	433, 411— 4 hrs.	331, 411, 426, 432, 434 or 436, 461 18 hrs.	433, 411— 4 hrs.	433, 411— 4 hrs.
Home and Family Life Child Development and Family Relations	112, 131, 233 7 hrs.	112, 131, elective— 7 hrs.	112, 131, elective— 7 hrs.	112, 131, elective— 7 hrs.	112, 131, elective— 7 hrs.	112, 131, 233, 433—10 hrs.	112, 131, 233 or 331, 433 10 hrs.	112, 131, 232, 233, 235, 332, 433, 461 or 439 and 436 25 hrs.	112, 131, 233, 433—10 hrs.
Home Management	131, 331, elective 9 hrs.	131, elective 6 hrs.	131, elective 6 hrs.	131, 432 6 hrs.	131, 333 6 hrs.	131, 432, elec- tive—9 hrs.	131, 432, elective—9 hrs. (Elective in either area to complete 22 hrs.)	131, 432, elective—9 hrs.	131 or 231, 232, 331, 333, 431, 432, 433, 435 24 hrs.
Total hours required in Home Economics	38	47	47	47	47	44	61	50	61

Titles and descriptions of the courses listed above, as well as for all other home economics courses, are given in the department sections.

The chart on the next page shows the requirements outside the School of Home Economics.

REQUIREMENTS OUTSIDE THE SCHOOL OF HOME ECONOMICS

Requirements Outside of Home Economics	Curriculum Requirements for the Majors in Home Economics								
	Interior Design	Clothing and Textiles Fashion Option	Clothing and Textiles Merchandising Option	Food and Nutrition Dietetics Option	Food and Nutrition Business & Mdse. Option	General Home Economics	Home Economics Education	Home and Family Life Child Development and Family Relations Option	Home and Family Life Home Management Option
Art	136, 222, 2220, 2317, 2318, 2327, 328, 3316, and electives to complete 24 hrs.	136, 2319 or elective, 2318, 328—11 hrs.	136, 328, elective—8 hrs.	136, elective—6 hrs.	136, elective—6 hrs.	136, 2318	136, 2318,	136, 3317 or 3318	136, 2318
English	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.	131, 132; 231, 232—12 hrs.
History	231, 232*—6 hrs.	231, 232*—6 hrs.	231, 232*—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232*—6 hrs.	231, 232*—6 hrs.
Government	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.	231, 232—6 hrs.
Physical Education or Band	4 hrs.	4 hrs.	4 hrs.	4 hrs.	4 hrs.	4 hrs.	4 hrs.	4 hrs.	4 hrs.
Accounting			234—3 hrs.						
Education							332, 334—6 hrs.	4344—3 hrs.	
Marketing			332, 335, 334 or 4315—9 hrs.		321, 334—5 hrs.				
Music, Art Appreciation or Anthropology						Elective 3 hrs.			
Religious Education or Philosophy						Elective 3 hrs.			
Speech, Radio, TV, Journalism						Elective 3 hrs.			Elective 3 hrs.
Sciences Natural & Behavioral	19 hrs. including SOC 230 or 233 and ZOOL 243 or BIOL 142	19 hrs. including SOC 230 or 233 and ZOOL 243 or BIOL 142	19 hrs. including SOC 230 or 233 and ZOOL 243 or BIOL 142	26 hrs. including CHEM 141, 142, 341, 342, MBIO 231, ZOOL 243, SOC 230 or 233	19 hrs. including CHEM 133, 134, SOC 230 or 233, ZOOL 243	19 hrs. including SOC 230 or 233 and ZOOL 243 or BIOL 142	19 hrs. including SOC 230 or 233 and ZOOL 243 or BIOL 142	19 hrs. including SOC 230 or 233 and ZOOL 243 or BIOL 142	19 hrs. including SOC 230 or 233 and ZOOL 243 or BIOL 142
Total Hours Required Outside Home Ec.	46-48	58	67	60	51-53	62	59	56	56
Elective hours	In home economics—3 hrs. Free—20-22 hrs.	Free—22 hrs.	Free—13 hrs.	Free—20 hrs.	Free—22 hrs.	Free—21 hrs.	Free—7 hrs.	Free—21 hrs.	Free—10 hrs.

* HIST 330 is acceptable in lieu of 231, 232.

Graduate Study. The departments in the School of Home Economics participate extensively in the master's degree programs offered by Texas Technological College. For details see the *Catalog of the Graduate School*.

General Degree Requirements of the School of Home Economics. The School of Home Economics offers work leading to the degree of Bachelor of Science in Home Economics with a major in clothing and textiles, food and nutrition, home economics education, or home and family life. The degree is also given with a major in general home economics for those students who wish a broad background of preparation for homemaking and related occupations but who do not wish to specialize in any one of the other professional areas of home economics. All undergraduate degree programs in home economics lead to the Bachelor of Science degree. The general requirements of the School of Home Economics for all programs are summarized in the three groups below. In the following section the special requirements for each program are indicated.

- I. Foundation courses in humanities and social and natural sciences, including the uniform requirements of the College (50 semester hours): ART 136; ENG 131, 132, 231, 232; GOVT 231, 232; HIST 231, 232*; P E or Band, 4 semesters; Social and Natural Sciences, 19 hours including SOC 230 or 233 and ZOOL 243 or 142.
- II. Home Economics core courses to provide basic concepts in personal and family living (17 semester hours): CDFR 112, 131; C & T 131; F & N 131; HMG 131; HEED 331 or 433, 411.
- III. Additional required and elective courses as specified in major degree programs to complete a total of a minimum of 127 semester hours for graduation—these degree programs vary in requirements from 127 semester hours to 132-134 semester hours.

Adjustments in degree requirements are made on an individual basis for mature students and for men students majoring in home economics.

The various options meeting degree requirements are described by each department, followed by charts of specific course requirements.

Department of Clothing and Textiles

This department supervises the following degree programs: CLOTHING AND TEXTILES, *Bachelor of Science in Home Economics* and *Master of Science in Home Economics*. Instruction is designed to prepare the graduate for a career in one of the many aspects of the clothing and textiles industry or for teaching clothing and textiles. In each of the programs, emphasis is placed on selection and purchase of clothing and textiles for the individual and for the home. One of four options may be chosen. A student in another school may have a minor in this department by completing 18 hours selected in conference with the department chairman.

Clothing and Textiles Options.

A. Fashion Option

This curriculum is planned to help the student develop creative ability and fashion judgment in preparation for entering some phase of fashion work; for example, designing, fashion coordinating, or retailing. This option provides opportunity for a wide choice of courses in the arts.

B. Merchandising Option

The merchandising program combines the fashion work of the department with courses in the School of Business Administration. Thus the student has an opportunity to develop discriminating taste in fashion as well as to obtain training in operations concerning retail functions.

Students who complete the fashion or the merchandising option may have the advantage of an additional training period with the employing firm.

C. Textile Science Option

Textile science prepares the individual to enter scientific fields of clothing and textiles, such as research, fabric analysis, and specification buying. This training is based on a strong background in chemistry, physics, and mathematics, plus the requirements in clothing and textiles. (Graduate study is needed for advancement in research.)

* HIST 330 may be taken in lieu of 231 or 232 except for certification in the Home Economics Education major.

D. Double Major Option

The double major option combines the requirements of the fashion option with the requirements of the Home Economics Education Department, thus preparing the student for teaching or for fashion work in either professional or commercial areas.

Clothing and Textiles Curriculum.

Fashion Option	Merchandising Option I. FOUNDATION CORE	Textile Science Option
ART 136 ENG 131, 132, 231, 232 GOVT 231, 232 HIST *231, 232 P.E., Band—4 semesters Social and Natural Sciences —19 hours including SOC 230 or 233 ZOOL 243 or BIOL 142 50 hours	Same as for Fashion Option 50 hours	Same as for Fashion Option, but science courses to include: CHEM 141, 142, 341 PHYS 141, 142 58 hours
II. HOME ECONOMICS CORE		
CDFR 112, 131 C&T 131 F&N 131 HMG 131 HEED 411, 433 17 hours	Same as for Fashion Option 17 hours	Same as for Fashion Option 17 hours
III. MAJOR COURSES		
C&T 231, 237, 332, 433, 438, 434, 436 21 hours	C&T 231, 237, 332, 334, 433, (or 438), 434, plus elective 21 hours	C&T 231, 237, 331, 332, 431, 433, 438 21 hours
IV. ADDITIONAL REQUIRED COURSES		
ART 2319 or elective, 328, 2318 CDFR elective F&N 231 or 331 HMG 131 17 hours	AOCT 234 ART 328, elective CDFR elective F&N 334 HMG 131 MKT 332, 336 MKT 4315 or 334 26 hours	ART 328, elective CDFR elective F&N 231 or 331 HMG 131 MATH 131 or 1315 MATH 151 22 hours
V. ELECTIVES TO COMPLETE 127 HOURS MINIMUM		
Electives, 22 hours (Recommended electives: Foreign language, 8 hours; Speech; Journalism; ART 130, 131)	Electives, 13 hours (Recommended electives: ECO 235; Speech; ART 130, 131, MGT 110)	Electives, 9 hours (Recommended electives: SPCH 239 or 338; ENG 233; ECO 235)

* HIST 330 is acceptable in lieu of HIST 231 or 232.

Courses in Clothing and Textiles.**FOR UNDERGRADUATES**

131. **Wardrobe Analysis, Construction, and Buying (3:1:4).** Prerequisite: ART 136 or concurrent.
132. **Apparel and Textile Selection (3:3:0).** For non-home economics majors. Selection in relation to the individual, to fashion, and to family needs.
231. **Textiles for the Consumer (3:3:0).** Selection, use, and care of textiles in relation to fiber composition, yarn and fabric structure, color and finish.
237. **Apparel Selection and Design (3:1:4).** Prerequisite: ART 136 or equivalent.
331. **Textile Fabrics: Properties and Performance (3:1:4).** Prerequisite: C&T 231 and CHEM 133, 134 or 141, 142. Physical and chemical properties of fibers, dyeing and finishing, fabric performance.
332. **Dressmaker Tailoring and Design (3:1:4).** Prerequisite: C&T 131, 237.
333. **Problems in Upholstering and Draperies (3:1:4).** Consumer problems in buying household textiles and upholstered furniture; finishing or refinishing chair frame and upholstery; construction problems in draw-draperies.
334. **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.

FOR UNDERGRADUATES AND GRADUATES

411. **Special Problems in Clothing and Textiles (1:0:3).** Prerequisite: C&T 332. May be repeated for 2 or 3 hours of credit.

- 431. Textile Testing and Analysis (3:1:4). Prerequisite: C&T 231, 331, and CHEM 141, 142.
- 432. Dress Design Through Draping (3:1:4). Prerequisite: C&T 332, 237.
- 433. History and Philosophy of Dress (3:3:0).
- 434. Fashion Fundamentals (3:3:0). Analysis of fashion relative to social, psychological and economic change. Significance of fashion to merchandising.
- 436. Flat Pattern Design (3:1:4). Prerequisite: C&T 237, 332.
- 437. Demonstration Techniques in Clothing (3:3:0). Prerequisite: C&T 332.
- 438. Historic Textiles (3:3:0).

FOR GRADUATES

- 511. Advanced Clothing Problems (1:0:3). May be repeated for credit.
- 518. Seminar in Clothing and Textiles (1:1:0). May be repeated for credit.
- 531. Special Problems in Clothing and Textiles (3:1:4). May be repeated for credit.
- 534. Custom Tailoring (3:1:4).
- 535. Advanced Problems in Upholstery, Draperies, and other Household Fabrics (3:1:4).
- 5335. Textiles for Elementary Teachers (3:3:0). Prerequisite: Graduate standing in elementary education. Consumer source materials; historical and recent developments in textiles; units of special significance for each elementary grade; special attention to consumer problems for the personal use of class members.
- 630. Master's Report (3).
- 631. Master's Thesis (3). Enrollment required at least twice.

Department of Food and Nutrition

This department supervises the following degree programs: *FOOD AND NUTRITION, Bachelor of Science in Home Economics*, and *Master of Science in Home Economics*.

These programs emphasize the increasingly important role of food and nutrition in the personal lives of people as well as in the operation of institutions of many types, such as hospitals, schools and colleges, industries, and military establishments. The aim of this department is to add to the liberal education of students through a knowledge of food and nutrition and to provide students with a sound foundation for professional careers in this area.

Food and Nutrition Options.

A. Dietetics Option

This curriculum meets the academic requirements for admission to approved dietetic internships as well as for membership in the American Dietetic Association. Graduates trained in this option qualify as dietitians for food service in institutions of every type, including both civilian and military hospitals, school cafeterias, college and university dormitories and student unions, commercial and industrial restaurants and cafeterias, and private club dining rooms.

The different branches of the military organizations of the United States need dietitians so urgently that each one has programs of financial assistance for students majoring in dietetics as well as for their internship.

B. Community Nutrition Option

This program is planned for students interested in the betterment of community health; it will prepare students to fill positions in nutrition services of departments of public health, social and welfare agencies, commercial organizations, and government agencies, such as the Extension Service and the Peace Corps. Electives should be chosen with the special area of interest in mind.

C. Research Option

The increasing stress placed on people trained for research requires that individuals prepare for this work during the undergraduate curriculum. The preparation for a research career in the area of nutrition requires additional training in chemistry and other sciences.

D. Business and Merchandising Option

This option is designed to meet the academic training of those interested in food photography and writing for news media, in developing recipes and products in test kitchens of various food industries, in presenting food programs on radio and television, and in directing consumer service of equipment and utility companies.

E. Double Major Option

The requirements of any option in food and nutrition may be combined with the requirements for a major in home economics education, with the number of hours required for graduation depending upon the option chosen.

Food and Nutrition Curriculum.

Dietetic Option	Community Nutrition Option	Research Option	Business and Merchandising Option
I. FOUNDATION CORE			
ART 136 ENG 131, 132, 231, 232 GOVT 231, 232 HIST *231, 232 P.E. or Band— 4 semesters Social and Natural Sciences, 26 hours, including MBIO 231 CHEM 141, 142, 341, 342 SOC 230 or 233 ZOO 243 57 hours	ART 136 ENG 131, 132, 231, 232 GOVT 231, 232 HIST *231, 232 P.E. or Band— 4 semesters Social and Natural Sciences, 26 hours, including CHEM 141, 142, 341, 342 PSY 332 or 335 SOC 230 or 233 ZOO 243 57 hours	ART 136 ENG 131, 132, 231, 232 GOVT 231, 232 HIST *231, 232 P.E. or Band— 4 semesters Social and Natural Sciences, 31 hours, including CHEM 141, 142, 241, 242, 341, 342 SOC 230 or 233 ZOO 243 62 hours	ART 136 ENG 131, 132, 231, 232 GOVT 231, 232 HIST *231, 232 P.E. or Band— 4 semesters Social and Natural Sciences, 19 hours, including CHEM 133, 134 SOC 230 or 233 ZOO 243 50 hours
II. HOME ECONOMICS CORE			
CDFR 112, 131 C&T 131 F&N 131 HMG 131 HEED 433, 411 17 hours	Same as for Dietetic Option 17 hours	Same as for Dietetic Option 17 hours	Same as for Dietetic Option 17 hours
III. MAJOR COURSES			
F&N 231, 320, 321, 331, 334, 439, plus electives to meet American Dietetic Assn. academic requirements 21 hours	F&N 231, 331, 334, 412, 422, 423, 424, plus electives 21 hours	F&N 231, 331, 334, 432, 436, plus electives 21 hours	F&N 231, 331, 334, 422, 425, 436, plus electives 21 hours
IV. ADDITIONAL REQUIRED COURSES			
Art elective CDFR elective C&T 231 HMG 432 12 hours	Art elective CDFR elective C&T 231 HMG 232 or 435 12 hours	Art elective CDFR elective C&T 231 HMG elective 12 hours	Art elective CDFR elective C&T 231 HMG 333 MKT 321, 334 17 hours
V. ELECTIVES TO COMPLETE 127 HOURS MINIMUM			
Electives, 20 hours	Electives, 20 hours	Electives, 15 hours	Electives, 22 hours

* HIST 330 is acceptable in lieu of HIST 231 or 232.

Courses in Food and Nutrition.

FOR UNDERGRADUATES

111. Food Service Workshop (1:0:3). Admission by special approval. May be used for degree credit with dean's approval.
131. Nutrition and Food (3:2:2). Science of nutrition and food as applied to everyday living.
211. Special Problems in Food Preparation (1:0:2). Prerequisite: F&N 131. Development of manipulative skills in food preparation.
231. Principles of Food Preparation (3:1:4). Scientific and efficient methods of food preparation.
320. Quantity Food Production and Service (2:1:3). Prerequisite: Junior standing of food and nutrition majors. Quantity food production and service; emphasis on quality of food, portion and cost control, and efficient food service.
321. Food Service Organization and Management (2:1:3). Prerequisite: Junior standing of food and nutrition majors. Organization and management of food production; emphasis on arrangement of work areas, time, costs, labor, and personnel management.
331. Meal Management (3:1:4). Prerequisite: Junior standing. Management of time, money, equipment, and energy in food purchasing, preparation, and serving family meals.
334. Human Nutrition (3:2:3). Prerequisite: Human anatomy and physiology or other biological science. Physiological functioning of nutrients, their availability, and emphasis in menu and dietary planning; bioassay and dietary analysis as tools in teaching and in research.

FOR UNDERGRADUATES AND GRADUATES

411. **Problems in Food and Nutrition (1:1:0).** May be repeated for credit.
412. **Field Work in Nutrition (1:0:3).** Prerequisite: F&N 423 and/or 424 or concurrent. Experience in hospital and community centers to enhance understanding of nutrition of people.
421. **Advanced Food Production Management (2:1:3).** Further study and experience in responsibility of management to produce quality food for group service.
422. **Food and the Consumer (2:2:0).** Prerequisite: Junior standing. Consideration and observation of numerous technological aspects of food in production, preservation, processing, and merchandising.
423. **Community Nutrition (2:2:0).** Prerequisite: F&N 334. The nutritional status and needs of groups of people in a community including preschool and school children, welfare cases, the aged, and the culturally deprived.
424. **Diet Therapy (2:2:0).** Prerequisite: F&N 334 and organic chemistry. Concepts of abnormal nutrition and disease treated by dietary modification.
425. **Food Demonstrations (2:1:2).** Prerequisite: F&N 331. Study, observation, and practice of demonstration methods used with food in teaching, merchandising, and television.
426. **Food Service Equipment and Layout (2:1:3).** Characteristics of various food facilities with emphasis on layout and equipment selection, operation and care.
432. **Advanced Human Nutrition (3:3:0).** Prerequisite: F&N 334 and organic chemistry. Concepts of normal nutrition in the chemistry and physiology of the human body.
436. **Experimental Methods with Food (3:1:6).** Prerequisite: F&N 331 and chemistry. Investigation of the chemical and physical factors influencing quality in food; consideration of proportions, manipulation of ingredients, and additives in preparation.
439. **Food Purchasing (3:2:2).** Prerequisite: Junior standing. Current economic, legislative, commercial, and industrial developments which affect the purchase of food.

FOR GRADUATES

515. **Special Aspects of Food and Nutrition (1:0:3).** May be repeated for credit.
531. **Research in Food and Nutrition (3:1:6).** May be repeated for credit.
533. **Seminar in Food and Nutrition (3:3:0).** May be repeated for credit.
534. **Advanced Problems in Human Nutrition and Foods (3:3:0).** May be repeated for credit.
5335. **Principles and Applications of Nutrition for Elementary Teachers (3:3:0).** Principles of nutrition, the nutrient and food requirements of the school child, and techniques for motivating children to sound food habits.
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required twice.

General Home Economics

The degree program in general home economics is designed for those students who wish a broad background of preparation for homemaking and related occupations but who do not wish to specialize in a professional area of home economics. See the chart on pages 203-204 for specific degree requirements.

Interdisciplinary Degree Programs.

- A. **With Arts and Sciences**—A major in applied arts leading to a Bachelor of Science degree in Home Economics with an option in nonprofessional interior design is available through coordination with the Department of Art. For specific requirements for this degree, see the chart mentioned above.
- B. **With Business Administration**—Students majoring in the Department of Management may qualify for a restaurant and institutional management option by taking 12 to 18 semester hours in food and nutrition courses in the School of Home Economics. The specific courses are selected in consultation with the Chairman of the Department of Food and Nutrition.

Department of Home Economics Education

This department supervises the following degree programs: HOME ECONOMICS EDUCATION, *Bachelor of Science in Home Economics* and *Master of Science in Home Economics*.

These programs prepare the student for careers in teaching or in home demonstration work of the Agricultural Extension Service, religious education work in church organizations, home service work with public utility programs, and other fields related to home economics. They also provide a valuable foundation for the vocation of homemaking.

Teacher Education. Each year a large number of West Texas high schools cooperate with the College in its student teaching program for home economics education students. In addition to student teaching, selected juniors in this department are offered an opportunity to serve as apprentice teachers in the summer phase of the high school homemaking program.

Each student working toward a teacher's certificate must file a certification plan with the Department of Home Economics Education during the last semester of the sophomore year.

Each person expecting to receive a teaching certificate in vocational homemaking must meet the following admission standards to student teaching:

1. Must have completed approximately 90 hours of the home economics education curriculum, including the requisite courses in professional home economics and a majority of the courses designed to support the major field.
2. Must file an application with the Department of Home Economics Education during the junior year to enroll in student teaching.
3. Must have a grade-point average of 2.25 or higher on all college work and a grade-point average of 2.25 or higher in professional education courses as well as in home economics courses. No grade below C in home economics courses will be accepted in establishing this average.
4. Must pass the health examination required of teachers in the school system in which the student teaching is performed.
5. Must present evidence that she is free from extreme handicaps that are judged by the Committee on Student Teaching to be detrimental to effective classroom instruction.
6. Must demonstrate proficiency in the use of the English language by a grade point average of 2.25 or higher in English courses.
7. Students transferring to Texas Technological College who wish to be recommended for certification must complete at least 3 semester hours at the College in each of the subject matter departments in the field of home economics. This requirement may be increased on the recommendation of the Chairman of the Department of Home Economics Education.

Double Major Option. A major in home economics education can be combined with one or more options in each of the other departments in home economics. In some cases, degree requirements for double majors can be met within the minimum of 127 hours for graduation but in other cases, the total hours for graduation may exceed this minimum. For the specific course requirements for the major in home economics education, see the degree requirements tables of the School of Home Economics.

Courses in Home Economics Education.

FOR UNDERGRADUATES

331. *Philosophy and Principles of Vocational Home Economics* (3:3:0). Prerequisite or parallel: HEED 332. For majors. Study and observation of typical vocational home economics programs in various school communities; principles of learning; critical review of literature, with emphasis on experimental data in various fields of home economics.
411. *Home Economics Seminar* (1:1:0). Required of all seniors in home economics. Emphasis upon professional aspects of employment; upon relating the total curriculum to professional use; upon research in home economics; upon continued growth of the home economist and current problems in home economics.

FOR UNDERGRADUATES AND GRADUATES

414. *Problems in Home Economics Education* (1:1:0) Prerequisite: HEED 331. Individual study of current problems in home economics education and their significance for curriculum development and teaching of home economics at the elementary, secondary and adult level.
426. *Problems in Student Teaching* (2:0:4). Parallel: HEED 432. Analysis of student teaching situations. May be repeated for credit.
432. *Methods of Teaching Home Economics* (3:3:0). Prerequisite: HEED 331; prerequisite or parallel SED 334. Development of plans for providing effective learning in home economics; selection, use, and evaluation of learning experiences; an analysis of observation of vocational home economics classes and programs.
433. *Introduction to Research in Home Economics* (3:3:0). Survey of research in selected areas of home economics; application of the scientific method to selected problems; understanding of recent theories of learning.
434. *Current Issues and Developments in Home Economics Education* (3:3:0). Adult education; recent trends in curriculum and their significance for home economics education at elementary and secondary school levels.
436. *Home, School, and Community Experiences in Home Economics Education* (3:3:0). Methods of evaluating the growth of the learner; provisions for effective learning in home economics through experiences in home, school, community, and Future Homemakers of America.
461. *Student Teaching in Home Economics* (6). Prerequisite: HEED 432.

FOR GRADUATES

514. *Specific Problems in Teaching Home Economics* (1:1:0). A study of the organization and presentation of selected areas or aspects of the home economics program. May be repeated for credit.
518. *Seminar in Home Economics* (1:1:0). Comprehensive consideration of research in home economics; presentation and consideration of individual student research problems in progress.
531. *Administration and Supervision of Home Economics Education* (3:3:0). Administration and supervision of typical home economics programs on both vocational and non-vocational bases, with special attention to resources, school-community curricula, and management. Designed for experienced home economists.

532. **Curriculum Development in Home Economics (3:3:0).** Philosophy and development of year-round program in home economics education; legislation affecting the home economics program; survey of recent curriculum developments and their implication for home economics education.
533. **Evaluation in Home Economics (3:3:0).** Procedures for appraisal of progress in the total program in home economics. Development of evaluative instruments and interpretation of data in the evaluation of various types of home economics programs.
534. **Techniques of Research in Home Economics (3:3:0).** Methods and techniques of research in home economics; interpretation of findings and application to selected situations and problems.
536. **Problems in Home Economics Education (3:3:0).** Individual and group problems according to special interests and needs of the class. May be repeated for credit.
537. **Techniques of Supervision in Home Economics (3:3:0).** Philosophy, responsibilities, and techniques of supervision in home economics. Designed for experienced home economists.
630. **Master's Report (3).**
631. **Master's Thesis (3).** Enrollment required at least twice.

Department of Home and Family Life

This department supervises the *Bachelor of Science in Home Economics* program in HOME AND FAMILY LIFE. Through affiliation with Merrill-Palmer Institute of Human Relations, Detroit, Michigan, competent advanced students have the privilege of selecting to do a term or semester of work in Detroit to broaden the scope of their professional training.

Home and Family Life Options.

A. Child Development and Family Relations Option

As the name suggests, this option offers the opportunity to study the various phases of the life of an individual from infancy through maturity with the inter-play of the many aspects of personal family and community relationships. Laboratory experiences with children of different ages help the college student to understand the stages and facets of development. These experiences also assist students in recognizing and establishing skills in working with young children and in developing basic concepts in child guidance. Laboratory experiences, at the same time, aid the college student in understanding his own development and behavior.

Studies in the family relations area provide the student with opportunity to gain information and to examine attitudes about mature personal and interpersonal relationships in college and at home. These relationships include courtship, marriage, family, and community living.

Students selecting the child development and family relations option are prepared for homemaking and for several areas of professional work. Teaching and working in preschool centers provide a challenging and worthwhile career for one who is interested in the younger child. Those who wish to continue in advanced education in this area are well prepared to do so. Others, who are interested in community services to youth and families, may seek specific additional training for positions in working with Girl Scouts, Campfire Girls, and in child welfare, special education, counseling, and parent education.

B. Home Management Option

Those electing this option are given preparation for homemaking or for such professional work as agricultural extension, college teaching, and in industries producing goods and services for the home. Students are assisted in setting goals and identifying values as a part of home management and in the solution of personal problems. Attention is paid to the study of the decision-making process as used by individuals and families in reaching their goals.

An important contribution in home management is the opportunity for residence in the Home Management House, as well as in modern mobile homes, located on the campus, where students experience many phases of home living, including the care of an infant. Married students enroll in a special section of home management which provides growth in decision making, experiences in management, and consumer information as well as work in household economics.

C. Double Major Option

A student desiring to combine a major in home and family life with preparation for teaching home economics in the secondary schools may select a double major in home and family life and home economics education.

Pre-nursing. While Texas Technological College does not offer courses in nursing arts, it does provide the regular college-level courses required in

all schools of nursing and which can be taken before enrollment in a specific school of nursing.

Prenursing students who come to Texas Technological College for some or all of their academic courses enroll in the School of Home Economics where an experienced counselor assists each student in the selection of courses each semester.

In general, two routes are open to prospective nursing students who come to Texas Technological College:

One, the student may take one or two years of academic college courses prior to transferring to a college or university offering a Bachelor of Science degree in nursing, or

Two, the student may prepare to qualify for admission to one of the two-year diploma programs of nursing in a hospital school of nursing.

Home and Family Life Curriculum.

I. FOUNDATION CORE

Child Development and Family Relations Option	Home Management Option
ART 136 ENG 131, 132, 231, 232 GOVT 231, 232 HIST *231, 232 P.E. or Band—4 semesters Social and Natural Sciences 18-20 hours, including SOC 230 or 233 ZOO 243 or BIOL 142	Same as for Child Development and Family Relations Option
50 hours	50 hours

II. HOME ECONOMICS CORE

Child Development and Family Relations Option	Home Management Option
CDFR 112, 131 C&T 131 F&N 131 HMG 131 HEED 433, 411	Same as for Child Development and Family Relations Option
17 hours	17 hours

III. MAJOR COURSES

Child Development and Family Relations Option	Home Management Option
CDFR 232, 233, 235, 332, 433, and either 461 or 436 and 439	HMG 231,** 331, 333, 431, 432, 433, 435
21 hours	21 hours

IV. ADDITIONAL REQUIRED COURSES

Child Development and Family Relations Option	Home Management Option
ART 3317 or 3318 C&T 231 ED 4344 F&N 334 HMG 432 HMG elective	ART 2318 CDFR 233, 433 C&T 231, 333, 332 F&N 331, 334, 425 Radio, T.V. or Journalism elective
18 hours	29 hours

V. ELECTIVES TO COMPLETE 127 HOURS MINIMUM

Child Development and Family Relations Option	Home Management Option
Electives, 21 hours	Electives, 10 hours

* HIST 330 is acceptable in lieu of HIST 231 or 232.

** HMG 231 is required only for transfer and/or mature students who did not take HMG 131 as freshmen.

Courses in Child Development and Family Relations.

FOR UNDERGRADUATES

111. Nursery School Organization and Management (1:1:0). Basic principles of the preschool program.
112. Personal Development (1:1:0). Relationship of the student to college; survey of the field of home economics; personal and academic group guidance.
113. Child Development and Behavior (1:1:3).
131. Personal and Family Relationships (3:2:2). Guidance in gaining competence in satisfying interpersonal relationships; observation and study of behavior.

231. **The Infant (3:3:0).** Physical and psychological preparation of the family for parenthood, study of prenatal development, infant behavior, care and growth to age two.
232. **Child Guidance (3:2:3).** Current concepts underlying behavior and methods of working with children.
233. **Child Growth and Development (3:2:3).** Study of growth and development of the child and his relationship with his family, peers, and teachers. Observation and participation in child development laboratory.
234. **The Child from Two to Four (3:2:2).** Systematic study of the physical, psychological, social and intellectual development of the child. Observations in the child development laboratory and in the family.
235. **Preparation for Success in Marriage (3:3:0).** Designed to consider the role of interpersonal relationships of dating, courtship and engagement.

FOR UNDERGRADUATES AND GRADUATES

331. **Later Childhood (3:2:3).** Development of the child from six to twelve years of age. Laboratory experience with school age children.
332. **Organization, Methods, and Materials in the Preschool Program (3:2:3).** Prerequisite: CDFR 232 and 233. Program planning for preschool children. Experience in using methods and materials appropriate to the preschool level.
333. **Early Years of Marriage (3:3:0).** Considerations of the problems of adjustment, interaction, establishment, and growth of the beginning family. Limited to child development and family relations majors and married students.
335. **The Adolescent in the Family (3:3:0).** Prerequisite: CDFR 233 or approval of department chairman. The adolescent's relationship to his family, his peer group, and to society.
433. **Family Relations (3:3:0).** Prerequisite: CDFR 235 or consent of chairman. The family as affected by composition, resources, traditions, with an introduction to family research.
436. **Community and Professional Responsibilities to Children and Families (3:3:0).** Study of community resources as they relate to welfare of children and families.
438. **Exceptional Children in the Family (3:2:3).** Personal-social development of exceptional children; family attitudes and responsibilities; utilization of community resources; co-operative laboratory work with related departments.
439. **Family Life in the Middle and Later Years (3:3:0).** Prerequisite: Junior standing. Needs that arise from changes in family relationships, living arrangements, income, and employment.
461. **Student Teaching in the Preschool (6).** Prerequisite: Senior classification and approval of department chairman in home and family life. Observation and direction of a program in a preschool situation.

FOR GRADUATES

518. **Seminar in Child Development and Family Relations (1:1:0).** Prerequisite: Graduate standing. May be repeated for credit.
534. **Special Topics in Child Development (3:3:0).** Prerequisite: Graduate standing. Advanced study of current research in child development.
536. **Advanced Interpersonal and Family Relations (3:3:0).** Group processes; factors influencing personal family adjustment; methods and techniques of teaching and counseling.

Courses in Home Management.

FOR UNDERGRADUATES

131. **Personal and Family Management (3:3:0).** For freshmen only. Use of human and material resources as they relate to the achievement of goals.
231. **Management Practices for the Individual and Family (3:3:0).** For students with 25 or more credit hours or married. Personal and family goals as they relate to human and material resource management. Comparison studies of individuals and families with respect to goals sought, resources available, and managerial ability.
232. **General Home Management (3:3:0).** For students who have had HMG 131, 231, or equivalent. Philosophy of home management; work simplification, planning for family financial security; and general management of all the family's resources.
233. **Physical Sciences in the Home (3:2:3).** Application of selected principles of physics and chemistry in the home. May count as a science in the School of Home Economics.
331. **Housing the Family (3:1:4).** Housing as it relates to satisfying family living; developing an understanding of housing needs and values in relation to family goals.
333. **Household Equipment (3:1:4).** Selection, use, and care of household equipment; includes kitchen and laundry planning.
335. **Family Finance and Consumer Education (3:3:0).** Principles involved in family finance and the implications for consumer education.

FOR UNDERGRADUATES AND GRADUATES

431. **Advanced Housing for the Family (3:1:4).** Prerequisite: HMG 331. New trends in housing, community and city development, home ownership, legal procedures, and financing.
432. **Home Management Living (3).** Prerequisite: 6 semester hours in home management. One-half semester residence with supervised experience in home living, including the care of an infant. Married students maintaining a home in the community work on home management problems with supervision.
433. **Advanced Household Equipment (3:1:4).** Prerequisite: HMG 333. New developments in equipment, including function, use, and value to the family.
435. **Advanced Consumer Problems (3:3:0).** Prerequisite: HMG 131 or 231. Advertising, labeling, regulations, and consumer protection. Savings and investments, credit, wills, insurance, and social security.

FOR GRADUATES

511. **Studies in Home Management (1:1:0).** Prerequisite: Graduate standing. Individual study of advanced problems in home management, work simplification, family financial security. May be repeated for credit.
518. **Seminar in Home Management (1:1:0).** Prerequisite: Graduate standing. Individual and group problems according to special interests and needs of the class. May be repeated for credit.
531. **Advanced Home Management (3:3:0).** Prerequisite: Graduate standing. Current problems in management, consumption, housing, and household equipment by individual study.

Official Directory 1967-1968

Board of Directors 1967-1968

Officers

ROY FURR, Chairman
C. A. CASH, Vice Chairman
J. ROY WELLS, Secretary

Members of the Board

Term Expires February 19, 1969

ROY FURR	Lubbock
HERBERT ALLEN	Houston
HAROLD HINN	Dallas and Plainview

Term Expires February 19, 1971

C. A. CASH	Amarillo
RETHA R. MARTIN	Lubbock
FLADGER F. TANNERY	Dallas

Term Expires February 19, 1973

ALVIN R. ALLISON	Levelland
MARSHALL FORMBY	Plainview
CARL E. REISTLE, JR.	Houston

Principal Administrative Officers

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| <p>Grover Elmer Murray, Pres. & Prof. of Geosciences, 1966. B.S., North Carolina, 1937; M.S., Louisiana State, 1939; Ph.D., 1942.</p> <p>Glenn E. Barnett,²³ Executive V. Pres. & Dean of the School of Education, also Prof. of Education, 1968. B.S. in Ed., Teachers Coll. (Kansas City), 1937; M.Ed., Missouri, 1939; Ed.D., 1943.</p> <p>William Martin Pearce,¹ Executive V. Pres. & Prof. of History, 1936, 1966. B.A., Southern Methodist, 1935; M.A., Texas Tech, 1937; Ph.D., Texas (Austin), 1952.</p> <p>Gerald Waylett Thomas,²⁴ Interim Exec. V. Pres., March-June, 1968. B.S., Idaho, 1941; M.S., Texas A & M, 1951; Ph.D., 1954.</p> <p>Sabe McClain Kennedy, V. Pres. for Academic Affairs & Prof. of Government, 1946,</p> | <p>1966. B.A., Texas Tech, 1943; M.A., 1946; Ph.D., Colorado, 1952.</p> <p>Marshall Lee Pennington, V. Pres. for Business Affairs, 1949, 1963. B.B.A., Texas (Austin), 1935.</p> <p>Bill J. Parsley, V. Pres. for Development, 1966. B.A. Texas Tech, 1952; LL.B., Texas (Austin), 1956.</p> <p>James Roy Wells, Asst. to Pres., & Secty., Board of Directors, 1951. B.A., Baylor, 1928; B.B.A., 1928; M.B.A., Colorado, 1931.</p> <p>Fred Durnford Rigby,²⁶ Asst. V. Pres. for Academic Affairs & Prof. of Mathematics, 1940, 1968. B.A., Reed Coll., 1935; M.S., State U. of Iowa, 1938; Ph.D., 1940.</p> |
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General Faculty and Administration

General Administration

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| <p>Jean K. Baker, Asst. to Pres., Office Mgr., 1966.</p> <p>Frank Clement Church, Traffic & Parking Counselor, 1967. B.S., Louisiana State, 1941; M.S., 1951.</p> <p>William Conner Cole, Gen. Mgr., Bookstore, 1927. B.B.A., Texas (Austin), 1924.</p> <p>Jesse Earl Crawford, Central Stores & Property Mgr., 1958. B.S., Mississippi State, 1951.</p> <p>Benge Robert Daniel, Mgr., Texas Tech Press, 1951. B.S., North Texas State, 1936; M.S., 1940.</p> <p>Billie Gene Daniels, Chief Security Officer, 1959.</p> <p>William Frank Dean, Dir., Student Publications & Part-time Instr. in Journalism, 1967. B.B.A., Texas Tech, 1961; M.Ed., 1965.</p> | <p>Olan Ray Downing, Dir., Building Maintenance & Utilities, 1936, 1961.</p> <p>Ellis Ray Forman, Asst. Mgr., Bookstore, 1934, 1939. B.A., Texas Tech, 1932.</p> <p>Richard Dale Furr, Supt., Research Farm & Visiting Prof. of Animal Husbandry, 1965. B.S., Sam Houston State, 1958; M.S., Oklahoma State, 1959; Ph.D., 1961.</p> <p>Anna Burt Gibson, Administrative Asst. to V. Pres. for Business Affairs, 1933, 1958.</p> <p>Jerry Platt House, Asst. Purchasing Agent, 1964. B.B.A., Texas Tech, 1955.</p> <p>Lillian Josephine Kirk King, Administrative Asst., Office of the Pres., 1963, 1966.</p> <p>Jerry Kirkwood, Campus Planning Comm., Coordinator, 1957, 1966. B.Arch., Texas Tech, 1954.</p> <p>James William Kitchen, Supt., Care & Maintenance of Grounds & Assoc. Prof. of Park Administration & Horticulture, 1964. B.S.,</p> |
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- Texas Tech, 1951; M.S., 1952; Ph.D., Texas A & M, 1964.
- Charles Frederick Libby, Dir., Building Operations, 1949, 1950.
- Katherine Arletta Lockhart, Administrative Asst. to V. Pres. for Development, 1955, 1956.
- D. M. McElroy, Dir. Educational TV, 1959, 1962.
- Jacob Homer Millikin, Dir., Extension & Correspondence, 1956. B.A., Baylor, 1927; M.A., Texas Tech, 1941.
- Carolyn Edwards Moss, Administrative Asst. to V. Pres. for Academic Affairs, 1960, 1966.
- Jim J. Northcutt, Dir., Environmental Health & Safety, 1965. B.S., Southwestern State (Oklahoma), 1954; M.Ed., West Texas State, 1959; Reg. Prof. Sanitarian (Texas).
- Robert Byron Price, Comptroller & Asst. Prof. of Accounting, 1953, 1967. B.B.A., Texas Tech, 1953; M.B.A., 1961; C.P.A.
- Mary Elizabeth Randal, Administrative Asst. to Executive V. Pres., 1928, 1967.
- Howard William Schmidt, Coordinating Architect for Construction in Progress, 1966. B.Arch., Texas Tech, 1950.
- Elvis Dean Smith, Purchasing Agent, 1960, 1963. B.B.A., Texas Tech, 1949; M.B.A., 1951.
- Hollis Royce Smith, Asst. Comptroller, 1958, 1967. B.B.A., Texas Tech, 1958.
- Virginia Lee Snelling, Head, Payroll Dept. & Employee Benefits, 1928, 1961. B.A., Texas Tech, 1931.
- John Gates Taylor, Business Mgr., 1949, 1963.
- Fredric John Wehmeyer, Dir., Personnel Office, 1961. B.B.A., Texas (Austin), 1958.
- Marshall A. Winegar, Supervisor, Stenographic Bureau, 1953, 1963.

Admissions and Registration

- Floyd D. Boze, Dean of Admissions & Prof. of Education, 1958, 1965. B.S., East Texas State, 1938; M.S., 1938; Ed.D., Tennessee, 1955.
- Florence Evelyn Clewell, Coordinator of Space & Dir., Institutional Studies, 1929, 1967. B.A., Oklahoma, 1929.
- Maryanne Reid, Dir., Foreign Student Admission & Instr. in Education, 1966, 1967. B.S., Northwestern, 1952; M.A., California (Los Angeles), 1955; Ed.D., Texas Tech, 1967.
- Kenneth Jay Wallace, Dir., Undergraduate Admissions, 1965, 1967. B.B.A., McMurry, 1962; M.B.A., Texas Tech, 1965.
- James Arthur Watkins, Registrar, 1965, 1967. B.S., Maryland, 1961; M.B.A., Indiana, 1962.

Biblical Literature

- Lowell Dean McCoy, B.S., M.S., under auspices of the Churches of Christ.
- Jack Greever, B.A., B.D., under the auspices of the Baptist General Convention of Texas.
- Ralph Edward Macy, B.S., B.D., under the auspices of the United Bible Chair of the Catholic, Episcopal, Lutheran, and Presbyterian churches.
- Cecil Raymond Matthews, B.A., B.D., D.D., under auspices of the Northwest Texas Conference of the Methodist Church.
- Arthur Albert Preisler, B.A., B.D., under auspices of the United Bible Chair of the Catholic, Episcopal, Lutheran, and Presbyterian churches.
- Titto Sammut, B.A., under auspices of the United Bible Chair of the Catholic, Episcopal, Lutheran, and Presbyterian churches.

Computer Center

- George Keating Hutchinson, Dir., 1966, 1967. B.S., Maine, 1955; M.S., Carnegie Inst. of Technology, 1956; Ph.D., Stanford, 1964.

- Don Douglas Aspromonte, Supervisor, Computer Operations, 1957. B.A., Fort Lewis Coll., 1963.
- Anne Barasch, Administrative Asst., 1967. B.F.A., Texas (Austin), 1957.
- George Kemble Bennett, Systems Engineer, 1966. B.S., Florida State, 1962; M.S., San Jose State, 1967.
- Raymond Eli Boche, Asst. Dir., Operations, & Part-time Asst. Prof. of Industrial Engineering, 1966. B.S., California State Polytechnic Coll., 1958; M.S., San Jose State, 1966.
- Paul Gene Griffith, Assoc. Dir. & Prof. of Electrical Engineering, 1963, 1967. B.S., Texas Tech, 1954; S.M., Massachusetts Inst. of Technology, 1956; Ph.D., Stanford, 1959; Reg. Prof. Engr. (Texas).
- Lou Anne Roberts, Research Assoc., 1967. B.S., Texas (El Paso), 1955; M.S., Texas Tech, 1960; Ph.D., California (Los Angeles), 1967.

Data Processing

- Ronald Nelson Brown, Dir., 1966.
- Gary Eugene Orren, Systems Analyst, 1964, 1966. B.S., Texas Tech, 1960.
- Pete Sellers, Supervisor of Computer Operations, 1949, 1963.

Ex-Students Association

- Philip Wayne James, Exec. Dir., 1957, 1960. B.S. in Ed., Texas Tech, 1957; M.Ed., 1964.
- Anthony W. Gustwick, Asst. Dir., 1962, 1966. B.S. in Ind. Mgt., Texas Tech, 1962.

Information Services

- Ronald Lee Hamm, Dir., 1965, 1967. B.A., Florida State, 1959.
- John Alfred Petty, Asst. Dir., 1966, 1967.

Institute for Evaporite Studies

- Alonso David Jacka, Dir. & Assoc. Prof. of Geosciences, 1959, 1968. B.S., Beloit, 1953; M.S., Wisconsin, 1957; Ph.D., Rice, 1960.

Intercollegiate Athletics

- Polk Fancher Robison, Dir. & Business Mgr. of Athletics & Assoc. Prof. of Health, Physical Education, and Recreation for Men, 1942, 1961. B.A., Texas Tech, 1934.
- Jerry Don Balch, Asst. in Football, 1966. B.S., Texas Tech, 1967.
- Burl Alva Bartlett, Asst. Football Coach, 1965. B.S., East Central State (Okla.), 1949.
- Ralph Carpenter, Sports Information Dir., 1967.
- John Francis Conley, Jr., Asst. Football Coach, 1961. B.S., Kansas State, 1949; M.S., 1953.
- Gerald Coppedge, Freshman Basketball Coach, 1967. B.S., Western New Mexico, 1960; M.S., Texas Tech, 1967.
- Eugene F. Gibson, Head Basketball Coach, 1954, 1961. B.S., Texas Tech, 1950.
- Guy Thomas Griffith, Asst. in Football, 1967.
- Daniel Eugene Henderson, Asst. Football Coach, 1967. B.S., Texas A & M, 1956.
- James Ruben Henkel, Asst. in Football, 1967.
- James Vernon Hilliard, Head Track Coach, 1964. B.B.A., Baylor, 1933; M.Ed., Hardin-Simmons, 1962.
- George Berl Huffman, Freshman Football Coach, 1935, 1961. B.A., Trinity, 1928.
- J. T. King, Head Football Coach, 1958, 1961. B.S., Texas (Austin), 1938.
- Matt Richard Lair, Jr., Asst. Football Coach, 1961, 1964. B.S., Kentucky, 1948; M.S., 1953.
- Charles Dewain Lynch, Asst. Basketball Coach, 1961. B.B.A., Texas Tech, 1959.
- Carlos Mainord, Asst. in Football, 1968. B.A., McMurry, 1968.
- James Faber McNally, Swimming Coach & Asst. Prof. of Health, Physical Education.

- and Recreation for Men, 1952, 1964. B.S., Oklahoma, 1952; M.Ed., Texas Tech, 1957.
- Bradley Mills, Jr.**, Asst. Football Coach, 1965, 1966. B.S., Kentucky, 1956.
- Paul Eugene Mitchell**, Part-time Golf Coach, 1968.
- George Rex Philbrick**, Tennis Coach & Prof. of Health, Physical Education, and Recreation for Men, 1947, 1961. B.S., Texas Tech, 1939; M.Ed., Texas (Austin), 1950.
- Clyde Lee Prestwood**, Athletic Counselor, 1961. B.S., Texas (Austin), 1940; M.Ed., Texas A & M, 1950.
- Kai Hill Segrist, Jr.**, Head Baseball Coach & Instr. in Health, Physical Education, and Recreation for Men, 1964, 1967. B.S., North Texas State, 1962; M.Ed., Texas Tech, 1965.
- Don Lewis Sparks**, Athletic Department Trainer & Part-time Instr. in Health, Physical Education, and Recreation for Men, 1958. B.S., Texas Wesleyan, 1950.
- Ruth Carrington Sturtz**, Ticket Mgr., 1967.
- Grant G. Teaff**, Asst. Football Coach, 1966. B.S., McMurry, 1956; M.Ed., 1957.
- Marion Thomas Wilson**, Asst. Football Coach, 1966, 1967.

International Center for Arid and Semi-Arid Land Studies (ICASALS)

- Thaddeus Wayne Box**, Dir. & Prof. of Range Management, 1962, 1967. B.S., Southwest Texas State, 1956; M.S., Texas A & M, 1957; Ph.D., 1959.
- Idris Rhea Traylor, Jr.**, Deputy Dir. & Asst. Prof. of History, 1960, 1967. B.A., Texas (Austin), 1957; M.A., 1959; Ph.D., Duke, 1965.

Library

- Ray Curtis Janeway**, Librarian, 1949. B.A., Kansas, 1938; B.S. in L.S., 1941; M.S., Illinois, 1944.
- Yu-Chum (Stella) Chang**, Asst. Catalog Libr., 1967. M.S., Texas Woman's, 1966.
- Margaret Asher Dickson**, Asst. Catalog Libr., 1957, 1965. B.S., Texas Tech, 1943; M.L.S., Texas Woman's, 1964.
- Susanne Sandborn Goddard**, Asst. Catalog Libr., 1963. B.A., North Texas State, 1956; B.S. in L.S., 1957.
- Virginia Suddath Goodman**, Catalog Libr., 1966. A.B., Oklahoma, 1933; A.B. in L.S., 1940.
- Mary Frances Gordon**, Reference Libr., 1963. B.S., West Texas State, 1938; B.A. in L.S., Oklahoma, 1942.
- Mary Ruby Green**, Assoc. Reference Libr., 1966. B.S. Texas Tech, 1938; M.A. in L.S., Denver, 1954.
- Virginia Lee Greenhill**, Asst. Catalog Libr., 1960. B.A., North Texas State, 1960.
- Leo Chi-Chien Ho**, Assoc. Catalog Libr., 1967. B.A., National Cheng-Chi U. (China), 1964; M.S., Atlanta U., 1967.
- Charles Finley Huey**, Asst. Order Libr., 1958, 1963. B.S., North Texas State, 1944; B.S. in L.S., 1962.
- Linda Bruce Jeanes**,¹⁵ Asst. Circulation Libr., 1967. A.B., Tufts (Jackson Coll.), 1965; M.S. in L.S., Simmons Coll., 1966.
- Walker Scott Lane**, Assoc. Reference Libr., 1965. B.S., West Texas State, 1963; M.L.S., North Texas State, 1967.
- Kathryn Dibbels Lewis**, Periodicals Libr., 1961, 1962. B.A. in L.S., Oklahoma, 1936; M.A. in L.S., 1958.
- Gloria G. Lyleria**, Assoc. Reference Libr., 1952, 1967. B.S., North Texas State, 1950; M.S., 1952.
- Dolores Melvin Maxwell**, Assoc. Reference Libr., 1963. B.A., Denver, 1944; M.A., Wisconsin, 1949; M.A. in L.S., 1963.
- Sibyl Pirtle Morrison**, Order Libr., 1947, 1964. B.S. in Ed., Texas Tech, 1940; B.L.S., California (Berkeley), 1947.

- Gall Allan Moul**, Circulation Libr., 1965. B.A., Furman, 1957; B.D., Southwestern Baptist Theological Seminary, 1961; M.L.S., North Texas State, 1966.
- George Willis Nelson**, Assoc. Reference Libr., 1966. B.B.A., Texas (Austin), 1957.
- Cora Fox Yonge Niell**, Asst. Periodicals Libr., 1961, 1963. B.A., Texas Woman's, 1937.
- James Edward Platz**, Assoc. Libr., 1949, 1955. B.A., Lawrence Coll., 1929; B.S. in L.S., Illinois, 1940.
- Pauline Dawn Pitts**, Asst. Catalog Libr., 1956. B.A., Southeastern State, 1930; B.A. in L.S., Oklahoma, 1936; M.S., Illinois, 1951.
- Gerald Herbert Sandy**, Bibliographer, 1965. B.A., State U. of Iowa, 1928; B.S., Illinois, 1929; M.A., 1932.
- Katrina Adele Savage**, Asst. Documents Libr., 1965. B.A., Texas Tech, 1964; M.L.S., North Texas State, 1965.
- Frank Millett Temple**, Assoc. Libr., 1951, 1963. B.S., Boston, 1950; B.S. in L.S., North Texas State, 1951; M.A., Texas Tech, 1959.
- Ferrelline Tucker**, Documents Libr., 1942, 1949. B.A., Texas Tech, 1940; B.S. in L.S., California (Berkeley), 1949.
- Jene Wallace Wagner**, Bibliographer, 1967.
- Ruth Winik**, Assoc. Reference Libr., 1967. B.A., Illinois, 1949; M.L.S., California (Los Angeles), 1965.

Museum

- Francis Earl Green**, Dir., 1952, 1965. B.S., Texas Tech, 1950; M.S., 1951; Ph.D., 1954.
- Lou Carter Keay**, Field Representative, 1965.
- Dorothy Jane Rylander**, Administrative Asst., 1953, 1958. B.A., Texas Tech, 1930; M.A., 1931.
- Margaret Spoon Sandy**, Services Coordinator, 1960. B.A., Wisconsin, 1927; M.A., Illinois, 1934.

Official Publications

- Seymour Vaughan Connor**, Editor & Prof. of History, 1953, 1965. B.A., Texas (Austin), 1948; M.A., 1949; Ph.D., 1952.
- Gale Rose Webber**, Asst. Editor, 1967. B.S., Carnegie Inst. of Technology, 1962.

Placement Service

- Jean Ayres Jenkins**, Dir., 1947, 1956. B.A., Texas Tech, 1935.
- Floy Sample Morrison**, Asst. Dir., 1965, 1966. B.S., Carnegie Inst. of Technology, 1932.

Residence Halls

- Guy Junior Moore**, Dir., Residence Halls, 1963. B.S., Southern Illinois, 1957; M.S., 1963.

Food Service

- Shirley Schulz Bates**, Dir., 1948, 1951. B.S., Southwest Texas State, 1940.
- Bess Arnall Banks**, Administrative Asst., 1950, 1951.
- Margaret Ragsdale Birkinman**, Asst. Dir., 1948, 1956. B.S., Texas Tech, 1940.
- James Chalmers**,¹⁶ Mgr., 1967.
- Nathalee Courtney**, Mgr., 1966, 1967. B.S., Texas Tech, 1963.
- Mary Elizabeth Elliott**, Supervisor, 1950, 1964. B.S., Texas Tech, 1939; M.S., 1950.
- Myrtle Warner Forrester**, Mgr., 1960, 1965.
- Joe Blanks Holmes**, Mgr., Residence Hall Central Food Facilities, 1964. B.S., Texas (Austin), 1933.
- Lillian Jo Bledsoe Lewis**, Mgr., 1960. B.S., Texas Woman's, 1930.
- Laverne Chron Meacham**, Mgr., 1958.
- Dolores Jean Kaufman Mollhagen**, Mgr., 1967. B.S., Fort Hays Kansas State, 1962.

- Stella Edna Peeks, Supervisor, 1955, 1965. B.S., Texas Coll. of Arts & Industries, 1944; M.S., Texas Tech, 1949.
- Florence Stone Pierce, Dietitian, 1962, 1967. B.S., Texas Tech, 1949.
- Eris Manney Porter, Mgr., 1961.
- Mildred Novell Ray, Mgr., 1965, 1967.
- Virginia Simpson Roberson, Mgr., 1961, 1963.
- Hazel Glossom Roberts, Mgr., 1960.
- Delma Bains Scott, Dietitian, 1962, 1963. B.S., Howard Payne, 1940.
- Jimmie Leda Self, Mgr., 1966, 1967.
- Gertrude Elizabeth Umlang, Mgr., 1967. B.S., Texas (Austin), 1931.
- Clair Dean Ray Westbrook, Mgr., 1959, 1964.

Room Reservations

- Hubert Lee Burgess, Coordinator, 1934, 1964.
- Billy Donn Haynes, Asst. Coordinator, 1960, 1967. B.A., Wayland Baptist, 1960.

Supervisory Staff For Men

- George Alverton Rhodes, Coordinator, 1966. B.S., Texas Tech, 1949.
- James Oliver Bartholomew, Supervisor, Carpenter Hall, 1965. B.S., United States Air Force Academy, 1959.
- John Henry Buechler, Supervisor, Weymouth Hall, 1966, 1967.
- Billy Joe Davis, Supervisor, Gordon Hall, 1965, 1967. B.S., Texas Tech, 1960; M.Ed., 1963.
- Roy Lee Lazenby, Supervisor, Thompson Hall, 1967. B.S., Eastern New Mexico, 1963.
- Martin Virgil Lucas, Supervisor, Gaston Hall, 1967.
- Terry Michael O'Donnel, Supervisor, Murdough Hall, 1966. B.B.A., Texas Tech, 1965.
- Bobby Leroy Short, Supervisor, Wells Hall, 1967.
- W. C. Smith, III, Supervisor, Sneed Hall, 1967. B.S., Angelo State, 1967.
- Leslie Leon West, Supervisor, Bledsoe Hall, 1965. B.S., Texas Tech, 1951.

Supervisory Staff For Women

- Dorothy Taft Garner, Coordinator, 1956, 1964. B.A., Oklahoma, 1928; M.A., 1933; M.Ed., 1956.
- Margaret Patten Applegate, Counselor, Chitwood Hall, 1962, 1967.
- Roselaine Louise Ashton, Relief Counselor, 1967. B.A., Texas Tech, 1967.
- Lucille Griffin Berry, Counselor, Hulen Hall, 1964, 1965.
- Caroline Mason Bosworth, Counselor, Doak Hall, 1958. B.A., Oklahoma, 1932; M.Ed., 1958.
- Sarah Emily Yates Burden, Counselor, Gates Hall, 1958, 1964.
- Rita Burleson, Counselor, Clement Hall, 1964. B.A., Trinity, 1923; M.Ed., Texas Tech, 1951.
- Carolyn Shepard Cates, Counselor, Coleman Hall, 1967. B.A., Texas Tech, 1964; M.A., 1967.
- Ruth LaVerne Causey, Counselor, Knapp Hall, 1967. B.S., Texas Woman's, 1944; M.S.E., Henderson State Teachers, 1961.
- Frances P. Dillard, Counselor, 1966. B.A., Arkansas, 1964; M.Ed., 1966.
- Lucille Lee Farley, Relief Counselor, 1967.
- Elen Louise Gilpin, Asst. Counselor, Stangel Hall, 1967. B.A., Baylor, 1939.
- Joyce Handy Harper, Counselor, Drane Hall, 1965, 1967.
- Rita Ann Holcomb,¹⁰ Counselor, Wall Hall, 1967. B.A., Texas Tech, 1961, 1968.
- Shirley Lomax Mansell, Counselor, West Hall, 1961. B.A., Goucher Coll., 1926.
- Alice Lawrence May, Counselor, Weeks Hall, 1954, 1964.
- Ruth Livermore Norton,¹⁶ Counselor, Wall Hall, 1965. B.S., Northwestern, 1928; M.Ed., Texas Tech, 1951.
- Leta Ferrel Pogue, Relief Counselor, 1967.

- Genevieve Simpson Stinnett, Counselor, Horn Hall, 1963. B.S., West Texas State, 1952; M.Ed., 1954.
- Marsha Ann Wilson, Asst. Counselor, Chitwood Hall, 1967. B.S., Texas Tech, 1967.
- Ruby-Mai Jackson Wise, Relief Counselor, 1965.

Southwest Collection

- Roy Sylvan Dunn, Dir. & Assoc. Prof. of Sociology, 1956, 1963. B.A., Texas (Austin), 1948; M.A., 1951.
- Doris Arlane Blaisdell, Assoc. Archivist, 1960, 1963. B.A., American U., 1944; M.A., Wisconsin, 1948; Ph.D., 1953.
- David Bergen Gracy, II, Archivist, 1966. B.A., Texas (Austin), 1963; M.A., 1966.
- Jimmy Marion Skaggs, Asst. Archivist & Teaching Asst. in History, 1965, 1967. B.S., Sul Ross State, 1962; M.A., Texas Tech, 1965.

Student Health Center

- Frederick Paul Kallina, Dir. & Physician, 1948, 1959. B.S., Texas A & M, 1942; M.D., Baylor, 1945.
- Bertha Nell Adair, R.N., Nurse, 1960. Seton Infirmary, 1921.
- Hattie M. Childress, R.N., Supervising Nurse, 1953, 1965. Schumpert Memorial Hospital, 1935.
- Edith Margaret Cruce, R.N., Nurse, 1964. West Texas Hospital School of Nursing, 1944.
- Ella A. Ewing,¹⁸ R.N., Nurse, 1964. Scott and White Nurses Training School, 1930.
- Barbara Ruth Gray, R.N., Nurse, 1962. Mercy Hospital School of Nursing, 1943.
- Orra Robert Hand, M.D., Physician, 1965. B.S., Wisconsin, 1928; M.D., Washington, 1930.
- Nell Hefner, Medical Technologist, 1952. Sealy Hospital, 1935.
- Edith A. Kuhnley, R.N., Supervising Nurse, 1959, 1965. Northwest Texas Hospital, 1947.
- Mabel L. Lane,¹⁰ R.N., Nurse, 1968. U. of Texas School of Nursing, 1946.
- Barbara G. McCall,¹⁸ R.N., Nurse, 1964. St. Mary's School of Nursing, 1959.
- Iris Jane Norman, R.N., Supt. of Nurses, 1951. Lubbock School of Nursing, 1937.
- Marvin Charles Schlechte, M.D., Physician, 1966. B.S., Texas (Austin), 1936; M.D., Texas (Medical Branch), 1940.
- Ruth Evelyn Gardner Schlechte, M.D., Physician, 1966. B.A., Baylor, 1936; M.D., Texas (Medical Branch), 1940.
- Elizabeth Ann Terrell, R.N., Nurse, 1965. Shannon School of Nursing, 1965.

Student Life

- James George Allen, Dean of Student Life & Prof. of English, 1927, 1950. B.A., Southern Methodist, 1924; M.A., Harvard, 1928.
- Dudley Stephenson Akins, Financial Aid Adviser, 1967.
- Neal Allison Chastain, Asst. Dir., Student Union, 1967. B.B.A., Texas Tech, 1953; M.Ed., 1954.
- Joe E. Clark, Night Mgr., Student Union, 1967. B.S., Texas Tech, 1965.
- William Henry Duvall, Assoc. Dean of Men, 1967. B.A., Maryland, 1961; M.Ed., 1964; Ed.D., Indiana, 1967.
- Bruce A. Hancock, Financial Aid Adviser, 1966. B.A., Texas Tech, 1966.
- Jonathan E. Hartshorne, Adviser to International Students, 1967. B.A., Lawrence, 1963; B.D., Yale, 1967.
- Myrtle Roberta Higgins, Asst. Dean of Women, 1967. B.S., East Central State (Okla.), 1937; M.S., Oklahoma State, 1950.
- Lewis Norton Jones, Dean of Men, 1947, 1953. B.S., Texas Tech, 1938; M.A., 1939.
- Nelson Henry Longley, Dir., Student Union, 1955, 1958. B.A., Southeastern Louisiana Coll., 1954.

- Gertrude Morse, Food Service Mgr., Student Union, 1953, 1962. B.S., Texas Tech, 1935.
- Kathryn Peddy, Asst. to the Dean of Women, 1967. B.A., Southern Methodist, 1964.
- Florence Louise Phillips, Dean of Women & Part-time Prof. of Psychology, 1954, 1964. B.A., Marshall, 1944; M.A., Michigan State, 1946; Ed.D., Indiana, 1958.
- Dorothy Bruce Pijan, Program Dir., Student Union, 1963, 1964. B.M., Texas Tech, 1960; M.Ed., 1963.
- Thomas Paul Stover, Dir., Student Financial Aids, 1962. B.A., Ohio Wesleyan, 1958; M.S., Indiana, 1961.
- Dennis Newt Watkins, Asst. Dean of Men, 1964, 1965. B.B.A., Texas Tech, 1964.

Textile Research Center

- Charles Calvin Wilson, Dir., also Chmn. & Prof. of Textile Engineering, 1967. B.S. in T.E., Texas Tech, 1938.
- Harry Edward Arthur, Asst. Dir., 1946, 1967. B.S. in T.E., Texas Tech, 1949.
- Maurice Earl Heard, Research Coordinator & Prof. of Textile Engineering, 1928, 1967. B.S. in T.E., Texas Tech, 1931; Reg. Prof. Engr. (Texas).
- Herbert Ernest Kleke, Textile Technologist, 1965, 1967.
- William Harry Martin, Assoc. Dir. & Prof. of Textile Engineering, 1967. B.S. in Chem., Bradley, 1947; M.S., in Text.

- Tech., Inst. of Textile Technology, 1949; Ph.D., 1951.
- Reva E. Whitt, Fiber Technologist, 1960, 1967.

University Counseling Center

- James Edward Kuntz, Dir. & Prof. of Psychology, 1951, 1959. B.S., Fort Hays Kansas State, 1937; M.S., 1938; Ph.D., Purdue, 1950.
- Neida Alice Clark, Counseling Psychologist, 1967. B.A., Texas Tech, 1938; M.A., Texas (Austin), 1962.
- Virginia Carol Horsman, Counseling Psychologist, 1964. B.A., Texas Tech, 1937; M.A., 1960; Ph.D., 1964.
- Marjorie Flory Kuntz, Psychometrist, 1958. B.A., McPherson, 1938.
- Carolyn Jane Manicom, Psychometrist, 1967. B.A., Texas Tech, 1967.
- Ted Theodore Richardson, Counseling Psychologist, 1967. B.S., Kansas State Coll., 1959; M.S., 1961.
- William George Rickman, Counseling Psychologist, 1965. B.A., Occidental Coll., 1959; M.A., 1963.

Water Resources Center

- Dan Moody Wells, Dir. & Assoc. Prof. of Civil Engineering, 1966. B.S. in C.E., Texas Tech, 1951; M.S. in C.E., Missouri, 1954; Ph.D., Texas (Austin), 1966; Reg. Prof. Engr. (Texas).

School of Agriculture

Dean & Staff

- Gerald Waylett Thomas,²⁵ Dean & Prof. of Range Management, also Chmn. West Texas Water Inst., 1958. B.S., Idaho, 1941; M.S., Texas A & M, 1951; Ph.D., 1954.
- James Wayland Bennett,³² Assoc. Dean & Prof. of Agricultural Economics, 1948, 1963. B.S., Texas Tech, 1948; M.S., Louisiana State, 1951; Ph.D., 1955.
- Carl Lesta Davis Ramsel, Administrative Asst., 1965, 1967. B.A., Texas Wesleyan, 1942.

Department of Agricultural Economics

- Willard Forest Williams, Chmn. & Prof., 1963. B.S., Oregon State, 1947; M.S., California (Berkeley), 1948; Ph.D., Purdue, 1952.
- James Wayland Bennett, Prof. & Assoc. Dean of the School of Agriculture, 1948, 1963. B.S., Texas Tech, 1948; M.S., Louisiana State, 1951; Ph.D., 1955.
- Marquis Lyndon Fowler, Prof., 1966. B.S.A., Arkansas, 1951; Ph.D., California (Berkeley), 1961.
- James Wilton Graves, Assoc. Prof., 1961, 1967. B.S., Cornell, 1952; M.S., Texas A & M, 1958; Ph.D., Michigan State, 1964.
- Herbert Warren Grubb, Assoc. Prof., 1964, 1966. B.S., Berea, 1958; M.S., Oklahoma State, 1960; Ph.D., North Carolina State, 1964.
- Rex Page Kennedy, Asst. Prof., 1966. B.S., Texas Tech, 1956; M.S., Texas A & M, 1961.
- Hong Yong Lee, Asst. Prof., 1963, 1964. B.S., Central Missouri State, 1959; M.S., Oklahoma State, 1962; Ph.D., 1967.
- Archle LeRoy Leonard, Assoc. Prof., 1947. B.S., Oklahoma State, 1931; M.S., 1934.
- David Garner Moorman, Asst. Prof., 1967. B.S., Texas Tech, 1961; M.S., 1963.
- James Ezra Osborn, Assoc. Prof., 1965, 1967. B.S., Oklahoma State, 1959; Ph.D., 1964.

- Thomas Richard Owens, Assoc. Prof., 1965; B.S., Pennsylvania State, 1948; M.S., 1956; Ph.D., Oregon State, 1962.

Research Assistants

- Wendell Coleman Barrick,¹² 1968. B.S., Texas Tech, 1966.
- James Carey Cato, 1967. B.S., Texas Tech, 1967.
- Richard Dee Chitwood, 1967. B.S., Texas A & M, 1966.
- Edward Benton Merrick, 1967. B.S., Texas Tech, 1962.
- James Ralph Nelson, 1966. B.S., Texas Tech, 1966.
- Patrick Douglas O'Brien,¹² 1968. B.S., Texas Tech, 1968.
- Jesse Carter Snodgrass, 1967. B.S., Texas Tech, 1961.
- Kenneth Wayne Stokes, 1967. B.S., Texas Tech, 1967.
- Olen Neal Walker, 1967. B.S., Texas Tech, 1966.

Teaching Assistants

- Wade Lewis Griffin, 1967. B.S., Texas Tech, 1967.
- Edward Merle Hinder,¹⁶ 1967. B.S., West Texas State, 1960.
- William Ray Masch,¹² 1968. B.S., Texas Tech, 1968.

Department of Agricultural Education

- Thomas Luther Leach, Chmn. & Prof., 1937, 1961. B.S., Texas Tech, 1934; M.S., 1939.
- Ulrich Lewis Eggenberger, Assoc. Prof., 1961, 1964. B.S., Kansas State, 1952; M.S., 1956; Ph.D., Iowa State, 1964.
- Levi Marlin Hargrave, Prof., 1946, 1964. B.S., Texas Tech, 1935; M.S., 1942.
- Gerald Waylett Thomas, Prof. & Dean of the School of Agriculture, 1958, (also Prof. of Range Management). B.S., Idaho, 1941; M.S., Texas A & M, 1951; Ph.D., 1954.

Department of Agricultural Engineering

- Willie Lee Ulich**, Chmn. & Prof., 1961. B.S., Texas A & M, 1943; M.S., 1947; Ph.D., Harvard, 1951; Reg. Prof. Engr. (Texas).
- Alan Dale Brashears**, Part-time Asst. Prof., 1967. B.S., Texas A & M, 1961; M.S., 1963. Reg. Prof. Engr. (Texas).
- Marvin John Dvoracek**, Assoc. Prof., 1962, 1967. B.S., Texas A & M, 1953; B.S., 1959; M.S., California (Davis), 1962. Reg. Prof. Engr. (Texas).
- Walter Grub**, Assoc. Prof., 1966. B.S., Rutgers, 1949; M.S., Cornell, 1953.
- Joseph Clarence Newell**, Asst. Prof., 1967. B.S., Clemson, 1941; M.S., Arkansas, 1951.
- Roland Zelbert Wheaton**, Assoc. Prof., 1966. B.S., Michigan State, 1954; M.S., 1959. Dr. Engr., California (Davis), 1967.
- Ira Lawson Williams**,³ Prof., 1952, 1961. B.S., Texas A & M, 1930; M.S., Iowa State, 1931. Reg. Prof. Engr. (Texas).

Research Associate

- Albert Wayne Sechrist**, 1964. B.S., Texas Tech, 1964.

Department of Agronomy and Range Management

- Arthur Wesley Young**, Chmn. & Prof., 1935, 1938. B.S., Iowa State, 1929; M.S., 1930; Ph.D., 1932.
- Bonnie L. Allen**, Prof., 1959, 1965. B.S., Texas Tech, 1948; M.S., Michigan State, 1951; Ph.D., 1960.
- Cecil Irvy Ayers**, Prof., 1942, 1960. B.S., Texas Tech, 1936; M.S., 1944; Reg. Plant Breeder (Texas).
- Eric George Bolen**, Asst. Prof., 1966. B.S., Maine, 1959; M.S., Utah State, 1962; Ph.D., 1967.
- Thadys Wayne Box**, Prof. & Organizational Dir., ICASALS, 1962, 1967. B.S., Southwest Texas State, 1956; M.S., Texas A & M, 1957; Ph.D., 1959.
- Alfred Eugene Coleman**, Assoc. Prof., 1964, 1967. B.S., Texas Tech, 1960; M.S., Purdue, 1962; Ph.D., 1964.
- Clarence Cottam**, Adjunct Prof., 1967. A.B., Brigham Young, 1927; M.S., American U., 1928; Ph.D., George Washington, 1936.
- Billie Eugene Dahl**, Assoc. Prof., 1967. B.S., Oklahoma State, 1951; M.S., Utah State, 1953; Ph.D., Idaho, 1966.
- Robert Arthur Darrow**,¹⁰ Adjunct Prof., 1968. B.S., New York State Coll., 1932; M.S., Arizona, 1935; Ph.D., Chicago, 1937.
- William Caleb Glazener**, Adjunct Prof., 1967. B.S., Texas Coll. of Arts and Industries, 1929; M.S., Texas A & M, 1943.
- Martin H. Gonzalez**, Consult. Prof., 1967. B.S. (equiv.), Instituto Tecnológico (Monterrey, Mexico), 1954; M.S., Texas A & M, 1957; Ph.D., Utah State, 1963.
- Clark Harvey**, Prof., 1954, 1961. B.S., West Texas State, 1939; B.S., Texas A & M, 1940; M.S., Iowa State, 1948; Ph.D., 1950.
- John Ray Hunter**, Assoc. Prof., 1958, 1967. B.S., Midwestern, 1949; M.Ed., Texas Tech, 1958.
- Chester Cartwright Jaynes**, Assoc. Prof., 1951, 1964. B.S., Texas Tech, 1949; M.S., 1957.
- Kenneth Clarence Kilian**, Asst. Prof., 1963. B.S., Wisconsin, 1956; M.S., 1961; Ph.D., 1963.
- Donald Allen Klebenow**,¹⁰ Asst. Prof., 1968. B.S., Montana, 1960; M.S., 1962.
- Raymond Erwin Meyer**, Asst. Prof., 1965. B.S., Kansas State, 1959; Ph.D., Oklahoma State, 1963.
- Joseph Lawrence Schuster**, Assoc. Prof., 1964, 1966. B.S., Texas A & M, 1954; M.S., Colorado State U., 1959; Ph.D., Texas A & M, 1962.

- Gerald Waylett Thomas**, Prof. & Dean of the School of Agriculture, 1958. B.S., Idaho, 1941; M.S., Texas A & M, 1951; Ph.D., 1954.
- William J. Waldrip**,¹⁰ Adjunct Prof., 1968. B.S., Texas A & M, 1949; Ph.D., 1962.
- Henry Albert Wright**, Asst. Prof., 1967. B.S., California (Davis), 1958; M.S., Utah State, 1962; Ph.D., 1964.

Department of Animal Husbandry

- Dale Wendell Zinn**, Chmn. & Prof., 1961, 1967. B.S., West Virginia, 1952; M.S., 1956; Ph.D., Missouri, 1967.
- Robert Custer Albin**, Assoc. Prof., 1964, 1967. B.S., Texas Tech, 1961; M.S., 1962; Ph.D., Nebraska, 1965.
- John Henry Baumgardner**, Prof., 1945, 1961. B.S., Texas Tech, 1939; M.S., 1940.
- Blaine Blair Bredenstein**, Asst. Prof. & Supervisor, Meat Industry Laboratory, 1966. B.S., Wisconsin, 1959; M.S., Illinois, 1961; Ph.D., 1965.
- Samuel Everett Curl**, Assoc. Prof., 1961, 1965. B.S., Sam Houston State, 1959; M.S., Missouri, 1961; Ph.D., Texas A & M, 1963.
- Ralph Marion Durham**, Prof., 1959. B.S., Colorado State U., 1948; M.S., Wisconsin, 1949; Ph.D., 1951.
- Richard Dale Furr**, Visiting Prof. & Supt., Research Farm, 1965. B.S., Sam Houston State, 1958; M.S., Oklahoma State, 1959; Ph.D., 1961.
- Fred George Harbaugh**, Prof. & Veterinarian, 1927, 1941. B.S., Iowa State, 1927; D.V.M., 1927.
- Frank Alden Hudson**, Assoc. Prof., 1960, 1962. B.S., Arizona State, 1952; M.S., New Mexico State, 1953; Ph.D., Oregon State, 1957.
- Coleman Art O'Brien**, Assoc. Prof., 1947, 1967. B.S., Texas A & M, 1944; M.S., 1945; Ph.D., 1964.
- Allen Floyd Parr**,¹⁰ Instr., 1968. B.S., Michigan State, 1966.
- Lloyd Bruce Sherrod**, Visiting Assoc. Prof., 1967. B.S., South Dakota State, 1958; M.S., Arkansas, 1960; Ph.D., Oklahoma State, 1964.
- Leland Frank Tribble**, Prof., 1967. B.S., Missouri, 1949; M.S., 1950; Ph.D., 1956.
- Kirk B. Turner**, Assoc. Prof., 1948, 1955. B.S., Utah State, 1939; M.S., Oklahoma State, 1941.

Research Assistants

- William Merrett Durfey**, 1967. B.S., Texas Tech, 1963.
- Larry Gene Finley**, 1967. B.S., West Texas State, 1967.
- Gary Lee Gann**, 1967. B.S., Texas Tech, 1966.
- Jack Edward McClung**, 1967. B.S., Texas Tech, 1966.
- Robert Gene Patterson, Jr.**, 1967. B.S., New Mexico State, 1967.

Department of Dairy Industry

- Juddie Johnson Willingham**, Chmn. & Prof., 1948, 1949. B.S., Texas A & M, 1931; M.S., Iowa State, 1937; Ph.D., 1942.
- Ronald Max Miller**, Asst. Prof., 1960, 1967. B.S., Texas Tech, 1958; M.S., Michigan State, 1960.
- Milton Lester Peeples**, Prof., 1951, 1967. B.S., Texas Tech, 1949; M.S. in Agri., 1954; Ph.D., Ohio State, 1960.

Department of Park Administration, Horticulture, and Entomology

- Elo Joe Urbanovsky**, Chmn. & Horn Prof., also College Landscape Architect, 1949, 1967. B.S., Texas A & M, 1931.

- Donald Ashdown,⁴ Prof., 1952, 1956. B.S., Utah State, 1942; Ph.D., Cornell, 1948.
- Bill Aubrey Chevalier, Instr., 1964. B.S.L.A., Louisiana State, 1964.
- Charles E. Doell,⁵ Visiting Prof., 1965, 1968. B.S., Minnesota, 1916; M.S., 1917; Diploma, Alexander Hamilton, 1922.
- George Oliver Elle, Prof. & Dir. Peace Corps Training Program, 1938, 1966. B.S., Oregon State, 1938; M.S., Texas Tech, 1941; Ph.D., Cornell, 1951.
- Arvil Curtis Hamilton, Sr., Part-time Instr., 1965. B.A., Hardin-Simmons, 1932.
- Ellis Wright Huddleston, Assoc. Prof., 1960, 1965. B.S., Texas Tech, 1956; M.S., Cornell, 1958; Ph.D., 1960.
- James William Kitchen, Assoc. Prof. & Dir., Care and Maintenance of Grounds, 1964;

1967. B.S., Texas Tech, 1951; M.S., 1952; Ph.D., Texas A & M, 1964.
- Thomas Alec Musiak, Instr., 1965. B.S., Massachusetts, 1961; B.L.A., 1965.
- Robert Rentoul Reed, Asst. Prof., 1957, 1962. B.S., Pennsylvania State, 1954.
- Glen Myrlyn Rydl,¹⁷ Asst. Prof., 1966; B.S., Texas A & M, 1962; M.S., 1963; Ph.D., 1967.
- Emmanuel Theodorus Van Nierop,¹⁸ Assoc. Prof., 1968. Lic. Middelbare Tropische Landbouw, 1948; B.S., Toronto, 1953; M.S., State Coll. of Forestry (New York), 1956; Ph.D., Cornell, 1963.
- Charles Richard Ward, Asst. Prof., 1967. B.S., Texas Tech, 1962; M.S., 1964.
- Edward William Zukauckas, Jr., Assoc. Prof. & Greenhouse Mgr., 1952, 1961. B.S., Rutgers, 1950; M.S., 1952.

School of Arts and Sciences

Dean & Staff

- Lorin Garfield Kenmer, Jr., Dean & Prof. of Geosciences, 1967. A.B., Eastern Kentucky State, 1947; M.S., Tennessee, 1949; Ph.D., George Peabody Coll. for Teachers, 1952.
- Ivan Lee Little, Assoc. Dean, also Chmn. & Prof. of Philosophy, 1946, 1967. B.A., Texas Tech, 1938; M.A., Nebraska, 1940; Ph.D., 1953.
- Kathryn Stallings Durham, Administrative Asst., 1942, 1957. B.A., Texas Tech, 1934.

Department of Art

- Billy Clarence Lockhart, Chmn. & Prof., 1955, 1960. B.S., West Texas State, 1950; M.Ed., Pennsylvania State, 1952; Ed.D., 1955.
- Quatha Power Baker, Part-time Instr., 1966. B.A., Texas Tech, 1966.
- Ethel Jane Bettler, Prof., 1947, 1967. B.S., Iowa State, 1929; M.Ed., Marquette, 1943.
- Richard Jarrell Cheatham, Jr.,³ Part-time Instr., 1966, 1968. B.S., Texas Tech, 1966; B.S. in Ed., 1968.
- Donald Jack Davis, Assoc., Prof., 1965, 1967. B.A., Baylor, 1959; M.A., 1961; Ph.D., Minnesota, 1966.
- Eula May White Dyer, Asst. Prof., 1966, B.A. Ed., East Central State, (Okla.), 1948; M.A., Texas Woman's, 1964.
- Lonnie Joe Edwards, Instr., 1965, 1967. B.Advertising Art and Design, Texas Tech, 1964.
- Dick Evans, Instr., 1966. B.F.A., Utah, 1964; M.F.A., 1966.
- Hugh James Gibbons, Asst. Prof., 1963, 1966. B.A., Pennsylvania State, 1959; M.A., 1961.
- Hiram Varner Greer, Asst. Prof., 1963, 1966. B.A., Texas Tech, 1955.
- Paul Dean Hanna, Jr., Asst. Prof., 1960, 1965. B.A., Austin Coll., 1951; M.F.A., Texas Christian, 1965.
- Jaclyn Flynn Harland, Instr. 1963. B.S., Texas Tech, 1961.
- Ray Wayne Hellberg, Assoc. Prof., 1962, 1967. B.A., Brigham Young, 1955; M.A., 1962.
- Richard Wayne Henton,⁷ Asst. Prof., 1967. B.S., Oklahoma State, 1960; M.S., 1961.
- Edna Nawanna Houghton, Assoc. Prof., 1932, 1957. B.S. in A.E., Texas Tech, 1930; B.A., Southern California, 1954; M.A., 1964.
- Peggy Faye Basom Howard, Asst. Prof., 1966. B.S., Texas Woman's, 1938; M.A., 1963.
- James Dean Howze, Assoc. Prof., 1958, 1965. B.A., Austin Coll., 1951; M.S., Michigan, 1958.
- Clarence Everit Kincaid, Jr., Prof., 1960, 1963. B.S., West Texas State, 1949; M.Ed., 1958; Ed.D., Pennsylvania State, 1960.
- Eleanor Jo Rude Kreneck,¹⁸ Part-time Instr., 1966. B.F.A., Texas (Austin), 1959.

- Lynwood Alois Kreneck, Instr., 1965. B.F.A., Texas (Austin), 1958; M.F.A., 1965.
- Franz Ferdinand Kriwanek, Assoc. Prof., 1963, 1967. B.A., (Equiv.), School of Fine Arts (Vienna, Austria), 1940; M.A., Iowa, 1961.
- Mary Alice Terry Larson, Instr., 1966. B.S., Texas Tech, 1964.
- Marjorie Ellen Graves Little, Part-time Instr., 1967. B.S., Syracuse, 1967.
- Troy Allen Lockard, Assoc. Prof., 1937, 1963. B.S., Texas Woman's, 1932; M.A., 1940.
- John James Mahlmann,⁷ Asst. Prof., 1967. B.F.A., Boston, 1962; M.F.A., 1963.
- Foster Leroy Marlow,¹⁸ Prof., 1965, 1967. B.S. in Ed., Eastern Illinois, 1949; M.S. in Ed., 1960; Ed.D., Pennsylvania State, 1965.
- Patricia Elaine Brown Marlow,¹⁶ Part-time Asst. Prof., 1965, 1966. B.S. in Ed., Eastern Illinois, 1950; M.S. in Ed., St. Cloud State, 1962.
- Frone Louise Lehmann Mintz, Part-time Instr., 1966. B.F.A., Oklahoma, 1966.
- Teresa Jane Neal, Part-time Instr., 1967. B.A., Iowa, 1967.
- Roderick Parkinson, Assoc. Prof., 1948, 1967. B.S. in Ed., Texas Tech, 1948; M.Ed., 1950.
- Juanita Little Pollard, Asst. Prof., 1966. B.A., Abilene Christian, 1931; M.A., Texas Woman's, 1952.
- John William Queen, Assoc. Prof., 1960, 1967. B.S., Houston, 1956; M.F.A., Kansas, 1962.
- Donna Rae Read, Asst. Prof., 1966. B.S., Iowa State, 1960; M.S., Tennessee, 1962.
- Francis B. Stephen,⁷ Assoc. Prof., 1967. B.F.A., Oklahoma, 1950; M.F.A., 1951.
- Betty Ann Street,⁷ Asst. Prof., 1967. B.S., Tennessee, 1958; M.S., 1959.
- James Howard Welborn, Part-time Instr., 1959. B.A., Texas Tech, 1945.

Teaching Assistants

- Sharon Elizabeth Creighton,¹⁶ 1967. B.A., Baylor, 1962.
- Forrest Edwin Gist, 1967. B.Advertising Art and Design, Texas Tech, 1967.
- Jeanne Pearson, 1967. B.S., Texas Tech, 1967.
- Bill Joe Sowell, 1967. B.A., Texas Tech, 1967.

Department of Biology

- Earl D. Camp, Chmn. & Prof., 1945, 1959. B.S., Texas Tech, 1941; M.S., New Mexico, 1943; Ph.D., Iowa, 1952.
- Archie Cornelious Allen, Assoc. Prof., 1963, 1967. B.A., North Carolina, 1955; M.A., 1958; Ph.D., Pittsburgh, 1961.
- Robert James Baker, Asst. Prof., 1967. B.S., Arkansas A & M, 1963; M.S., Oklahoma State, 1965; Ph.D., Arizona, 1967.
- Murray Whitfield Coulter, Assoc., Prof., 1964, 1967. B.A., Emory, 1954; M.S., Arizona,

- 1957; Ph.D., California (Los Angeles), 1963.
- Arthur McAuley Elliot, Assoc. Prof., 1961, 1966. B.S., Minnesota, 1953; M.S., 1960; Ph.D., 1961.
- John Edwin George, Asst. Prof., 1967. B.S., West Texas State, 1957; M.S., Texas Tech, 1960; Ph.D., Kansas, 1964.
- Robert Wayne Gorden, Asst. Prof., 1967. B.S., Manchester Coll., 1957; M.Ed., Georgia, 1962; Ph.D., 1967.
- Gerald Art Greenblatt, Asst. Prof., 1966. B.A., Los Angeles State, 1955; Ph.D., California (Davis), 1965.
- Lyle Carlton Kuhnley, Assoc. Prof., 1959, 1965. B.A., Minnesota, 1949; M.A., Texas (Austin), 1955; Ph.D., 1961.
- Harold Loyd Lewis, Asst. Prof., 1964, 1967. B.S., Texas Coll. of Arts and Industries, 1960; M.S., Houston, 1962; Ph.D., Arkansas, 1964.
- Mildred Eileen Lowe, Assoc. Prof., 1964, 1965. B.A., Texas Christian, 1954; M.S., Tulane, 1956; Ph.D., 1959.
- John Stephen Mecham, Assoc. Prof., 1965. B.S., Texas (Austin), 1950; M.S., Florida, 1952; Ph.D., Texas (Austin), 1955.
- Robert Wetsel Mitchell, Asst. Prof., 1965. B.S., Texas Tech, 1954; M.S., 1955; Ph.D., Texas (Austin), 1965.
- Robert Lewis Packard, Prof. & Asst. Dean of the Graduate School, 1962, 1967. B.S., Nebraska, 1951; M.A., Kansas, 1955; Ph.D., 1960.
- Paul Verdayne Prior, Prof., 1956, 1962. B.A., Iowa, 1946; M.S., 1947; Ph.D., 1954.
- Vernon Willard Proctor, Prof., 1956, 1963. A.B., Missouri, 1950; A.M., 1951; Ph.D., 1955.
- Francis Lewis Rose, Asst. Prof., 1966. B.S., Georgia, 1960; M.S., 1962; Ph.D., Tulane, 1965.
- Chester Morrison Rowell, Jr., Assoc. Prof., 1957, 1967. B.A., Texas (Austin), 1947; M.S., Texas A & M, 1949; Ph.D., Oklahoma State, 1967.
- Michael Kent Rylander, Asst. Prof., 1965. B.A., North Texas State, 1956; M.S., 1962; Ph.D., Tulane, 1965.
- Jesse Q. Sealey, Prof., 1928, 1955. B.A., Texas (Austin), 1928; M.A., 1928; Ph.D., 1951.
- Russell William Strandmann, Prof., 1948. B.S., Southwest Texas State, 1935; M.S., Texas A & M, 1937; Ph.D., Ohio State, 1944.
- Polly Cook Tilton, Asst. Prof., 1947, 1967. B.S., Texas Tech, 1947; M.S., 1951.
- James Robert Wall, Assoc. Prof., 1966, 1967. B.S., Virginia Polytechnic Inst., 1951; Ph.D., Cornell, 1955.
- Robert Terry Humphrey, 1967. B.A., Texas Western, 1966.
- Kathleen Key Johnson,¹⁰ 1968. B.A., Murray State Teachers Coll. (Kentucky), 1950; M.S., Mississippi State, 1952.
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- Shirley Abbott Nichols,¹⁰ 1967. B.S., Louisiana State, 1967.
- Anna Booker Parker, 1967. B.S., Tarleton State, 1965.
- Donald Allen Pittard,⁶ 1965. B.S. in Ed., Abilene Christian, 1964.
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- James Ernest Platz, 1967. B.S., Texas Tech, 1967.
- Jerry Wayne Purcell, 1966. B.S., Texas Tech, 1966.
- James Carroll Ramsey, 1967. B.S., Texas Tech, 1967.
- Linda Lee Esenwein Ramsey, 1967. B.S., Texas Tech, 1967.
- Paul Roger Ramsey, 1967. B.S., Texas Tech, 1967.
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- Margaret Louise Eriksson Sprott, 1966. B.A., Texas Tech, 1966.
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Department of Chemistry

- Joe Dennis, Chmn. & Prof., 1938, 1950. B.A., Austin Coll., 1933; M.A., Texas (Austin), 1937; Ph.D., 1942; D.Sc. (hon.), Austin Coll., 1964.
- Joe Alfred Adamcik, Assoc. Prof., 1957, 1961. B.S. in Chem., Texas (Austin), 1951; M.A., 1954; Ph.D., Illinois, 1958.
- John Arthur Anderson, Assoc. Prof., 1961, 1966. B.S., Colorado State U., 1952; M.S., 1954; Ph.D., Oregon State, 1962.
- Sally Eugenia Cauthen, Visiting Asst. Prof., 1967. B.S., Abilene Christian, 1953; M.S., Louisiana State, 1957; Ph.D., Oxford, 1965.
- Bertha H. Delaney, Instr., 1967. B.S., Kent State, 1946.
- Arthur Lincoln Draper, Assoc. Prof., 1959, 1961. B.A., Rice, 1948; M.A., 1949; Ph.D., 1951.
- Daniel Leon Englert,¹⁰ Instr., 1966, 1968. B.S., Texas Tech, 1966.
- Owen Clark Gayley, Instr., 1967. B.S., Grove City, 1963.
- James Laughland Gordon, Instr., 1966, 1967. B.S., Texas Tech, 1963.
- William Cecil Herndon, Assoc. Prof., 1966. B.S., Texas (El Paso), 1954; Ph.D., Rice, 1959.
- Samuel Hunt Lee, Jr., Prof., 1951, 1961. B.S., Texas (Austin), 1939; Ph.D., Ohio State, 1944.
- Irving Lipschitz, Asst. Prof., 1966. B.A., New York, 1957; M.S., 1961; Ph.D., Virginia Polytechnic Inst., 1965.
- Clinton Marsud McPherson, Asst. Prof., 1956, 1960. B.S., Texas Tech, 1947; M.Ed., 1952; Ed.D., 1959.
- John N. Marx, Asst. Prof., 1967. B.S., St. Benedict's Coll., 1962; Ph.D., Kansas, 1965.

Teaching Assistants

- Dede Armentrout, 1967. B.S. in Ed., South-West Texas State, 1967.
- Dale Lawrence Berry, 1967. B.A., San Jose State, 1965.
- Nancy Jo Jensen Bethea, 1966. B.S., Iowa State, 1964.
- Rebecca Woodhull Bolen, 1967. B.S., Texas Coll. of Arts & Industries, 1967.
- Brian Richard Chapman, 1967. B.S., Texas Coll. of Arts & Industries, 1967.
- Bart Cook, 1967. B.A., Kansas, 1965.
- Hector Saul Cuellar, 1967. B.A., Texas (Austin), 1966.
- Loyd Samuel Deen, Jr.,¹⁰ 1968. B.S., Texas A&M, 1967.
- Gene Kenan Estes, 1967. B.S., Tarleton State, 1964.
- Donald Charles Forester, 1966. B.A., Texas Tech, 1966.
- Leo Aldis Galloway, 1967. B.S. in Ed., Kearney State Teachers Coll., 1949; M.S., Oklahoma, 1963.
- Herschel Whitaker Garner, 1963, 1966. B.S., Stephen F. Austin State, 1962; M.S., Texas Tech, 1965.

- Roy Ernest Mitchell, Asst. Prof., 1966. B.S., Texas A & M, 1958; Ph.D., Purdue, 1964.
- Roy Lee Mueller, Instr., 1967. B.S., Texas Tech, 1966.
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- Richard Lee Redington, Asst. Prof., 1967. B.A., Minnesota, 1955; Ph.D., Washington, 1961.
- Robert George Rekers, Assoc. Prof., 1955, 1961. B.S., Rochester, 1942; Ph.D., Colorado, 1951.
- Henry Joseph Shine, Prof., 1954, 1960. B.Sc., U. of London (England), 1944; Ph.D., 1947; A.R.I.C.
- Pill-Soon Song, Asst. Prof., 1965. B.S., Seoul National U. (Korea), 1958; M.S., 1960; Ph.D., California (Davis), 1964.
- Margaret Russell Stuart, Assoc. Prof., 1946, 1959. B.A., Texas Tech, 1940; M.A., 1949.
- Morris Frank Stubbs, Prof., 1963. B.A., Sterling Coll., 1921; M.S., Chicago, 1925; Ph.D., 1931; D.Sc. (hon.), Sterling Coll., 1960.
- Richard John Thompson, Assoc. Prof., 1962, 1966. B.S., Texas (Austin), 1952; M.A., 1956; Ph.D., 1959.
- Bob Lawrence Victor, Instr., 1964, 1967. B.S., Roosevelt, 1961; M.S., Texas Tech, 1966.
- Richard Edward Wilde, Jr., Assoc. Prof., 1963, 1967. B.S., California (Los Angeles), 1956; Ph.D., Washington, 1961.

Teaching Assistants & Part-time Faculty

- Thomas Eugene Anderson,¹⁸ also Research Fellow, 1966, 1967. B.S., Texas Tech, 1965.
- Leo Alexander Andron, II, 1967. B.S., Texas (Austin), 1967.
- Charles Milton Baldwin, Welch Foundation Scholar, 1965, 1966. B.A., U. of Corpus Christi, 1962.
- Earl Richard Beaver, Welch Foundation Scholar, 1966, 1967. B.A., McMurry Coll., 1966.
- Finis Lynn Cavender,¹⁶ 1967. B.S., Texas Tech, 1960; M.S., 1962.
- Joan Chung-Ying Chen, Welch Foundation Scholar, 1965. B.S., Cheng Kung U. (Taiwan), 1965.
- Michael Lee Dillon, Welch Foundation Scholar, 1966, 1967. B.S., Texas Tech, 1966.
- David A. Drake,¹⁰ 1968. B.S., Texas Tech, 1968.
- Jerold Feuer, also Research Fellow, 1967. B.S., Florida Atlantic U., 1966.
- Richard Don Goodin, National Aeronautics and Space Administration Trainee, 1967. B.S., Texas Tech, 1967.
- Phillip Warren Grayson,¹⁸ Welch Foundation Scholar, 1963. B.S., Lamar Inst. of Technology, 1963; M.S., Texas Tech, 1966.
- Joseph Harvey Harris, Welch Foundation Scholar, 1966. B.S., Texas Tech, 1966.
- John Edgar Hicks,¹⁶ 1965. B.A., McMurry Coll., 1965.
- William Eugene Kurtin, Welch Foundation Fellow, 1966. B.A., U. of Saint Thomas, 1965.
- Michael Angelo Latino, National Aeronautics and Space Administration, 1966. B.A., U. of Saint Thomas, 1965.
- Ana Maria Lorenzelli, 1967. B.S., U. of La Plata (Argentina), 1964; M.S., U. of Brazil, 1966.
- Raymond Cecil McMillon, Jr., 1966. B.S., Baylor, 1966.
- Gordon Earl Nicholson,¹⁶ 1967. B.S., Norwich, 1965.
- Herman Douglas Ramsey, 1967. B.S., Eastern New Mexico, 1965; M.S., 1967.
- Ernesto Silber, 1967. B.S., U. of La Plata (Argentina), 1964; M.S., 1967.
- Juana Josefa Chessa de Silber, 1967. B.S., U. of La Plata (Argentina), 1964; M.S., 1967.

- Roy Lynn Sparks, Research Asst., 1966, 1967. B.S., Wayland Baptist Coll., 1966.
- Larry K. Sveum, Welch Foundation Fellow, 1964, 1967. B.S., North Dakota, 1964. M.S., Texas Tech, 1966.

Department of Classical & Romance Languages

- Harley Dean Oberhelman, Chmn. & Prof., 1958, 1964. B.S., Kansas, 1950; M.A., 1952; Ph.D., 1958.
- Beatrice Witte Alexander, Asst. Prof., 1945, 1961. B.A., Texas Woman's, 1942; M.A., Texas (Austin), 1946.
- Faye LaVerne Bumpass, Prof., 1943, 1965. B.A., Texas Tech, 1932; M.A., 1934; D.Lit., San Marcos U. (Lima, Peru), 1947.
- Laura Ballew, Instr., 1964. B.A., Texas Tech, 1964.
- John James Bodoh, Asst. Prof., 1966. B.A., St. Paul Seminary, 1953; M.A., Wisconsin, 1958; Ph.D., 1966.
- Irma Nelda Galindo Bollinger, Instr., 1966. B.S., Texas Tech, 1960; M.A., 1965.
- Peter Drago Bubresko, Asst. Prof., 1964. B.A., U. of Belgrade (Yugoslavia), 1933; M.A., 1935.
- Peder George Christiansen, Assoc. Prof., 1963, 1966. B.A., Carroll Coll., 1956; M.A., Wisconsin, 1957; Ph.D., 1963.
- Robert Gary Gore, Instr., 1967. B.A., Texas Tech, 1964; M.A., Wisconsin, 1967.
- Thomas Earle Hamilton, Prof., 1940, 1955. B.A., Southern Methodist, 1927; M.A., 1929; Ph.D., Texas (Austin), 1940.
- Arren Maynor Hardee, Assoc. Prof., 1963. B.A., South Carolina, 1947; M.A., 1948; Ph.D., California (Los Angeles), 1962.
- James Edward Holland,⁴ Instr., 1967. A.B., William Jewell Coll., 1963; M.A., Washington, 1966.
- Leonid Aurelijis Jirgensons,⁴ Asst. Prof., 1961. B.A., (Equiv.), U. of Hamburg (Germany), 1948; M.A., Minnesota, 1961.
- Sheldon Charles Klock, Jr., Asst. Prof., 1963. B.A., Pan American Coll., 1960; M.A., Tulane, 1963.
- Ferdinando Dante Maurino, Prof., 1965. B.A., City Coll., City U. of New York, 1939; M.A., Columbia, 1941; Ph.D., 1949.
- Henry James Maxwell, Prof., 1963, 1967. B.A., Nebraska, 1940; M.A., Wisconsin, 1941; Ph.D., 1955.
- Rosemary Patterson, Instr., 1966, 1967. B.A., Texas Tech, 1963; M.A., 1967.
- William Taylor Patterson, Asst. Prof., 1961. B.A., Kansas, 1954; M.Ed., Pennsylvania State, 1961; Ph.D., Stanford, 1967.
- Jean Henri Piersaerts, Part-time Instr., 1964. Technicien Horticole, Ecole Supérieure d'Horticulture de l'Etat (Vilvorde, Belgium), 1949.
- Mohamed Hachemi Saada, Instr., 1967. B.A., Texas (Austin), 1960; M.A., Minnesota, 1967.
- Harold Lester Simpson, Prof., 1962, 1966. B.S., Coll. of Charleston, 1951; M.A., Princeton, 1953; Ph.D., 1957.
- Alfred Bell Strehli, Prof., 1928, 1961. B.A., Ohio State, 1925; B.S., 1925; M.A., 1926.
- Scotti Mae Tucker, Prof., 1945, 1964. B.A., Texas (Austin), 1924; M.A., 1925; Ph.D., 1950.
- Cherryll Ann Wagner,¹⁸ Instr., 1967. B.A., Montana, 1961; M.A., Washington, 1963.
- Frank Doster Wetherill, Asst. Prof., 1965. B.A., Pomona Coll., 1952; M.A., Colorado, 1957; Ph.D., Southern California, 1964.

Teaching Assistants

- Patrick Stephen Baldwin, 1966. B.A., North Texas State, 1966.
- Veleta Kaye Bryant, 1967. B.A., Texas Tech, 1967.

- Maria Emilia Pereira da Rocha**, 1967. B.S., Texas Wesleyan, 1960; M.R.E., Southwestern Baptist Theological Seminary, 1962; M.A., Texas Tech, 1966.
- Caren Kay Hervey Ferguson**,¹⁰ 1968. B.S. in Ed., Texas Tech, 1968.
- Crescencio John Hernandez**, 1967. B.A., Texas Tech, 1965.
- Carol Rose Koetting**, 1967. B.A., Texas Tech, 1966.
- Jane Irwin Mallinoff McDivitt**,⁸ 1967. B.A., Florida, 1966.
- Ray Saavedra Renteria**, 1967. B.A., Texas Tech, 1967.
- Alta Ada Cates Schoner**, 1964, 1966. B.A., Texas Tech, 1964; M.A., 1966.
- James Reginald Swann**, 1967. B.A., East Texas State, 1966.
- Cletis Irene Leavelle Tatum**, 1966. B.A., Texas Tech, 1964.
- Jan Hart Bishop Thrash**, 1967. B.A., Lamar State Coll. of Technology, 1967.
- Floy Rebecca Hord Trail**, 1966. B.A., Texas Tech, 1966.
- James George Wilcox**, 1966. B.A., California (Berkeley), 1952.

Department of English

- Everett Alden Gillis**, Chmn. & Prof., 1949, 1964. B.A., Texas Christian, 1936; M.A., 1939; Ph.D., Texas (Austin), 1948.
- Meredith Eugene Aker**, Instr., 1962, 1965. B.A., Tulsa, 1960; M.A., 1962.
- James George Allen**, Prof. & Dean of Student Life, 1927, 1950. B.A., Southern Methodist, 1924; M.A., Harvard, 1928.
- Joe Wilkes Berry, Jr.**, Asst. Prof., 1964. B.A., Abilene Christian, 1960; M.A., Rice, 1962; Ph.D., 1964.
- Earl Burk Braly**, Prof., 1966. B.A., Texas Tech, 1939; M.A., 1946; Ph.D., Texas (Austin), 1955.
- Mary Louise Breedlove Brewer**, Asst. Prof., 1941, 1962. B.A., Oklahoma Coll. for Women, 1928; M.A., Illinois, 1929; Ph.D., Texas (Austin), 1941.
- Beverly Dianne Brian**,⁴ Instr., 1961. B.A., Baylor, 1958; M.A., Duke, 1961.
- Andrew Scott Cairncross**, Visiting Prof., 1965. M.A., Glasgow U. (Scotland), 1922; D.Litt., 1932.
- Truman Wildes Camp**, Prof., 1935, 1949. B.A., Yale, 1926; Ph.D., 1935.
- Mary Sue Carlock**, Assoc. Prof., 1952, 1962. B.A., Southern Methodist, 1930; M.A., Texas (Austin), 1935; Ph.D., Columbia, 1958.
- Robert George Collmer**, Prof., 1967. B.A., Baylor, 1948; M.A., 1949; Ph.D., Pennsylvania, 1953.
- John Richard Crider**, Assoc. Prof., 1966. B.A., Baylor, 1953; M.A., 1954; Ph.D., Rice, 1960.
- James William Culp**, Prof., 1967. B.A., Abilene Christian, 1949; M.A., Vanderbilt, 1950; Ph.D., 1956.
- Leona Ford Dale**, Instr., 1961, 1965. B.A., Texas Tech, 1961; M.A., 1964.
- Kenneth Waldron Davis**, Assoc. Prof., 1955, 1965. B.A., Texas Tech, 1954; M.A., Vanderbilt, 1955; Ph.D., 1963.
- Charles Lynn Devore**, Instr., 1967. B.A., Midwest Christian Coll., 1965; M.A., Ft. Hayes Kansas State, 1967.
- Floyd Eugene Eddleman**, Assoc. Prof., 1958, 1965. B.S.E., Arkansas State Teachers, 1951; M.A., Arkansas, 1955; Ph.D., 1961.
- Jack Edwards**, Instr., 1967. B.F.A., Texas (Austin), 1954; M.A., 1960.
- James Maurice Foster**, Asst. Prof., 1966. B.S., Illinois, 1962; M.A., 1963; Ph.D., 1966.
- Berthold Claudio Friedl**, Visiting Prof., 1965. Baccalaureate, Lycee Victor Hugo Besancon, 1922; M.A., Chicago, 1928; D.Litt., L'Universite de Paris (France), 1931.
- Ruth Evelyn Galloway**, Instr., 1967. B.A., Nebraska State Teachers, 1948; M.A., West Texas State, 1965.
- Henry Wilton Gautreau, Jr.**, Instr., 1965. B.S., Louisiana State, 1956; M.A., 1962.
- Lola Beth Green**, Assoc. Prof., 1946, 1959. B.A., Texas Tech, 1935; M.A., 1942; Ph.D., Texas (Austin), 1955.
- Alan Murray Finlay Gunn**,³ Prof., 1939, 1949. B.A., Huron Coll., 1927; M.A., Denver, 1928; Ph.D., Princeton, 1938.
- Jack Octa Hazlerig**, Instr., 1961, 1965. B.A., North Texas State, 1958; M.A., 1961.
- Ruth Donald Jackson**, Asst. Prof., 1946, 1959. B.A., Texas Tech, 1942; M.A., Oklahoma, 1946.
- Horace Grady Lackey, Jr.**, Instr., 1963. 1966. B.A., Hardin-Simmons, 1948; M.A., Texas Tech, 1966.
- Thomas Alexander Langford**,⁴ Asst. Prof., 1965, 1968. B.A., California (Riverside), 1956; M.A., Texas Tech, 1963; Ph.D., Texas Christian, 1967.
- Quannah Belle Lewis**, Asst. Prof., 1946, 1959. B.F.A., Oklahoma, 1931; M.A., Texas Tech, 1940.
- Travis Leon Livingston**, Instr., 1967. B.A., Howard Payne, 1955; M.A., Hardin-Simmons, 1961.
- Joseph Thomas McCullen, Jr.**, Prof., 1949, 1955. B.A., North Carolina, 1937; M.A., 1939; Ph.D., 1948.
- Florence Manley McNeil**, Instr., 1961. B.A., Illinois, 1925; M.A., Texas Tech, 1951.
- Jackie Charles Meathenia**, Instr., 1966. B.S., West Texas State, 1957; M.A., 1959.
- Marie Agnes Miles**, Asst. Prof., 1946, 1955. B.A., West Texas State, 1930; M.A., Texas (Austin), 1937.
- Joseph John Mogan, Jr.**, Assoc. Prof., 1966. B.A., S.T.B., St. Mary's Seminary and U., 1948; M.A., Notre Dame, 1954; Ph.D., Louisiana State, 1961.
- Kilne Allen Nail**, Prof. & Chmn. of Freshman English, 1944, 1959. B.A., Texas Tech, 1937; M.A., 1939; Ph.D., Texas (Austin), 1952.
- William Durward Norwood, Jr.**, Assoc. Prof., 1965. B.A., Baylor, 1950; M.A., Lamar State Coll. of Technology, 1962; Ph.D., Texas (Austin), 1965.
- Joseph Clayborne Nunnally**, Instr., 1967. B.A., Texas Tech, 1964; M.A., 1965.
- James Arthur Rushing**, Instr., 1952. B.S., in Journ., Southern Methodist, 1949; M.A., 1951.
- Jane Gilmore Rushing**, Part-time Asst. Prof., 1967. B.A., Texas Tech, 1944; M.A., 1945; Ph.D., 1957.
- Ruth Wilson Russell**, Asst. Prof., 1948, 1959. B.S., Oklahoma, 1932; M.A., 1936.
- Carl George Schrader, Jr.**, Instr., 1967. B.A., Baylor, 1951; B.D., Southwestern Baptist Theological Seminary, 1955; M.A., Texas Christian, 1961.
- Dorothy Clare Ruggles Smith**, Instr., 1967. B.A., Texas (Austin), 1947; M.A., Columbia, 1951.
- Stella Prude Smith**, Instr., 1960, 1963. B.A., Texas (Austin), 1940; M.A., Texas Tech, 1962.
- William Alva Stephenson**, Instr., 1967. B.A., Pan American Coll., 1963; M.A., Texas Tech, 1965.
- Jeri Tanner**, Instr., 1966. B.A., East Texas State, 1961; M.A., 1963.
- Dahlia Jewell Terrell**, Asst. Prof., 1956, 1966. B.A., Texas Tech, 1940; M.Ed., 1948; Ph.D., Texas (Austin), 1966.
- Donald Richard Theall**, Instr., 1965, 1966. B.A., Southwestern Louisiana, 1962; M.A., Texas Tech, 1965.
- James Curtis Tucker**, Instr., 1967. B.A., Richmond, 1965; M.A., Virginia, 1967.
- Ahmet Edip Uysal**,⁹ Visiting Prof., 1966. M.A., Aberdeen U. (Scotland), 1948; Ph.D., Ankara U. (Turkey), 1952.
- Warren Stanley Walker**, Prof., 1964. B.A., State U. of New York (Albany), 1947; M.A., 1948; Ph.D., Cornell, 1951.

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Teaching Assistants

Jeanette Moody Abshire, 1967. B.A., Texas Tech, 1967.
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Donald Lee Cook, 1956. B.A., Hardin-Simmons, 1958; M.A., Texas (Austin), 1963.
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Carolyn Dalton,¹⁶ 1967. B.S., West Texas State, 1967.
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Nancy Ann Dilley, 1967. B.S., Wisconsin, 1966.
Charmazel Dudt, 1966. B.A., U. of Allahabad (India), 1959; M.A., 1961.
Janet Mary Essary, 1967. B.A., Texas Tech, 1967.
Linda Lucille Everton, 1967. B.A., Baylor, 1959; M.A., Texas (Austin), 1962.
Charles Leslie Fewell, 1967. B.A., Texas Tech, 1967.
Florence Margaret Healy French, 1966. B.F.A., Iowa, 1943; M.A., Texas Tech, 1967.
Donald Eric Fritz, 1967. B.S., Texas Tech, 1957; B.A., 1967.
Mary Elizabeth George,¹⁰ 1968. B.A., Baylor, 1943; M.A. George Peabody, 1947.
Elizabeth Ann Gibson, 1967. B.A., Texas Christian, 1965.
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Mary Ann Greene, 1967. B.A., Texas Tech, 1967.
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Charles Willis Hughes, 1966. B.A., Texas (Austin), 1957.
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Connie Beth McMillan, 1966. B.A., Texas Tech, 1966; M.A., 1967.
Marjorie Enid Mason, 1966. B.A., Morningside Coll., 1935.
Charles Litten Mazer, 1967. B.A., Texas Tech, 1967.
Molly Michael Miller, 1967. B.S., Southwestern, 1964.
Sandra Ellen Muse, 1967. B.A., Angelo State, 1967.
Kelly Joan Nelson, 1957. B.A., Midwestern, 1965.
Mary Ann Norman,¹⁶ 1967. B.A., Texas Tech, 1967.

Michael Peters, 1965. B.A., Texas Tech, 1965; M.A., 1967.
Charles Ashley Petty, 1967. B.A., Midwestern, 1967.
Ethrich Houston Rogers, Jr., 1966. B.A., Texas Tech, 1966.
Mary Earle Persons Russell, 1966. B.A., Southern Methodist, 1961.
Dorothy Lucille Schantz, 1967. B.A., West Texas State, 1941.
Glenda Lee Shamburger, 1967. B.A., Texas Tech, 1965.
Michael Douglas Smith, 1967. B.A., Southwestern Louisiana, 1967.
Gail Addison Spaeth, 1967. B.A., Texas (Austin), 1966.
Virginia Belle Stanley, 1967. B.A., Mary Hardin-Baylor, 1960.
Mary Sabette Stephens, 1967. B.A., Texas Tech, 1967.
Jon Loren Summers, 1967. B.A., Luther Coll., 1963.
Ramona June Summers, 1967. B.A., Pan American Coll., 1960.
Evelyn Joyce Thompson,¹⁰ 1968. B.A., Texas Tech, 1967.
Lois Ruth Glenn Thrash, 1965. B.A., Lamar State Coll. of Technology, 1962; M.A., Texas Tech, 1966.
Donna Humphlett Tucker, 1967. B.A., Lakewood Coll., 1964.
Nancy Telfair Varnell, 1965. B.A., Texas Tech, 1965; M.A., 1967.
Lonnie Howard Wheeler, 1967. B.S., Texas Tech, 1962.
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Walter Asa Winsett, 1966. B.A., North Texas State, 1966.

Department of Geosciences

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Stanley Edward Cebull, Asst. Prof., 1967. A.B., California (Berkeley), 1956; M.A., 1958; Ph.D., Washington, 1967.
James Roland Craig, Asst. Prof., 1967. B.A., Pennsylvania, 1962; M.S., Lehigh, 1964; Ph.D., 1965.
John Joseph Dowling, Asst. Prof., 1967. B.S., St. Louis, 1957; M.S., Tulsa, 1960; Ph.D., St. Louis, 1964.
William Madison Furnish, Jr., Visiting Prof., 1967. B.A., Iowa, 1934; M.A., 1935; Ph.D., 1938.
Anton L. Hales, Adjunct Prof., 1967. Ph.D., Capetown, 1936.
Rae Lawrence Harris, Jr., Assoc. Prof., 1957, 1962. B.S., Oregon State, 1950; Ph.D., Columbia, 1957.
Alonzo David Jacka,¹³ Assoc. Prof. & Dir. Inst. for Evaporite Studies, 1959, 1968. B.S., Beloit, 1953; M.S., Wisconsin, 1957; Ph.D., Rice, 1960.
Lorin Garfield Kennamer, Jr., Prof. & Dean of the School of Arts and Sciences, 1967. A.B., Eastern Kentucky State, 1947; M.S., Tennessee, 1949; Ph.D., George Peabody Coll. for Teachers, 1952.
Karl Walter Klement, Assoc. Prof., 1964, 1965. Ph.D., U. of Tuebingen (Germany), 1959.
Gunnar Kullerud, Adjunct Prof., 1967. M.Sc., Norway, 1946; Ph.D., 1948; D.Sc. (hon.), Oslo, 1954.
William Donald Miller,¹⁶ Assoc. Prof., 1962, 1965. B.A., Texas Tech, 1957; M.S., 1959; Ph.D., Missouri, 1963.
Grover Elmer Murray, Prof. & President, 1966. B.S., North Carolina, 1937; M.S., Louisiana State, 1939; Ph.D., 1942.

- Corwin C. Reeves, Jr., Asst. Prof., 1957, 1962. B.S., Oklahoma, 1955; M.S., 1957.
- Robert Louis Reinking, Asst. Prof., 1967. B.S., Colorado Coll., 1963; M.S., Illinois, 1965; Ph.D., 1967.
- Deskin Hunt Shurbet, Jr., Prof. & Dir., Selsmological Observatory, 1956, 1961. B.S., Texas (Austin), 1950; M.A., 1951.
- Franklin Alton Wade,³ Horn Prof., 1954, 1967. B.S., Kenyon Coll., 1926; M.A., 1926; Ph.D., Johns Hopkins, 1937; D.Sc. (hon.), Kenyon Coll., 1963.
- T. Karl H. Wuerschling, Asst. Prof., 1965. B.A., Western Michigan, 1961; M.A., Michigan, 1962; Ph.D., 1967.
- Vestal Lirly Yeats, Asst. Prof., 1960, 1966. B.S., Texas (Austin), 1958; M.S., Texas Tech, 1960.

Teaching Assistants

- Ronnie Ray Allen,¹⁶ 1966. B.S., Texas Tech, 1966.
- Thomas Robert Bates,¹⁶ 1967. B.S., Texas Tech, 1967.
- Stephen Herring Danbom, 1966. B.S., Texas Tech, 1966.
- James Edward Florstedt, 1967. B.S., Eastern New Mexico, 1967.
- William George Hart, 1967. B.S., Texas Tech, 1967.
- William Rhodes Lees, 1967. B.S., Texas Tech, 1967.
- Steven Arthur McLean, 1967. B.S., Texas Tech, 1967.
- Charles Lee Oman, 1966. B.S., American U., 1961; M.S., 1966.
- Ronald H. Prewitt,¹² 1968. B.S., Texas Tech, 1967.
- James Courtney Reed,¹² 1968. B.S., Texas Tech, 1966.
- William Alvin Schaefer, 1967. B.S., Texas Tech, 1967.
- Robert Kenneth Stevens, 1966. B.S., Texas Tech, 1962.
- Karl Wendell Williams, 1967. B.S., Texas Christian, 1965; M.S., Texas Tech, 1967.
- Nelson Brent Yoder,¹² 1968. B.S., Texas Tech, 1966.

Department of Germanic & Slavonic Languages

- Carl Hammer, Jr., Chmn. & Horn Prof., 1964, 1967. B.A., Catawba Coll., 1934; M.A., Vanderbilt, 1936; Ph.D., Illinois, 1939.
- Theodor Walter Alexander, Assoc. Prof., 1947, 1959. B.S., Texas Tech, 1946; M.S., 1947.
- Evelyn Lewis Forrest, Instr., 1964, 1967. B.A., Texas Tech, 1964.
- Alexander Pope Hull, Jr., Assoc. Prof. & Dir., Language Laboratory, 1956, 1963. B.S., Virginia, 1944; Ph.D., 1955.
- Louis Thomas Jardine, Asst. Prof., 1963. B.A., Yale, 1950; M.A., California (Berkeley), 1954.
- Valda Lidija Jirgensons, Part-time Instr., 1966. B.A., Texas Tech, 1966.
- Wolodymyr Taras Zyla, Asst. Prof., 1963. B.S., U. of Manitoba (Canada), 1959; M.A., 1962; Dr.phil., Free Ukrainian U. (Munich, Germany), 1967.

Teaching Assistants

- Emily Johanna Anderson,¹⁰ 1968. B.A., Texas Tech, 1964.
- Ulrich Werner Boehnke, 1967. M.A., (Equiv.), U. of Tuebingen (Germany), 1966.
- Barbara Ona Bryant,¹⁰ 1968. B.A., Texas Tech, 1968.
- Jerry Albert Coombes,¹⁶ 1967. B.A., Texas Tech, 1967.
- Anna Jo Joiner D'Elia, 1966. B.A., Texas Tech, 1966.
- Helen Myrtle Kott, 1967. B.A., Texas Tech, 1967.

- Suzanne Langley,¹⁶ 1966. B.A., Texas Tech, 1966.
- Hugo Lentze, 1966. B.A., Texas Tech, 1966.
- Christa Elisabeth Kunkel Smith, 1967. B.A., Wayland Baptist, 1963; M.A., Texas Tech, 1967.

Department of Government

- Lynwood M. Holland, Chmn. & Prof., 1967. A.B., Emory, 1932; A.M., 1933; Ph.D., Illinois, 1945.
- Weldon Vernon Barton, Asst. Prof., 1967. B.A., Southwest Texas State, 1962; M.A., Florida State, 1963; Ph.D., 1965.
- Leon Wilford Blevins, Instr., 1967. B.A., Wayland Baptist, 1961; M.A., Texas (El Paso), 1967.
- Benjamin Beck, Assoc. Prof., 1940, 1966. B.S., Coll. of the City of New York, 1930; M.A., George Washington, 1934; Ph.D., Stanford, 1940.
- James Warren Bowman, Part-time Instr., 1956. B.A., Texas Tech, 1949; LL.B., Texas (Austin), 1953.
- John Howard Burnett, Jr., Asst. Prof., 1966. A.B., West Virginia Wesleyan, 1958; M.A., Emory, 1960; Ph.D., 1966.
- Shirley Chapman, Assoc. Prof., 1965, 1967. B.S., Florida Southern, 1951; M.A., Emory, 1958; Ph.D., 1962.
- Hung-Ti Chu,¹⁰ Prof., 1968. B.A., Wisconsin, 1932; M.A., Missouri, 1933; Ph.D., Illinois, 1937.
- James William Davis, Prof., 1938, 1944. B.A., Texas A & M, 1928; M.A., Texas (Austin), 1931; Ph.D., 1940.
- Edwin Larry Dickens, Instr., 1965. B.A., Texas (Austin), 1962; M.A., Texas Coll. of Arts & Industries, 1963.
- Paul Edward Fuchs, Instr., 1967. B.A., Hunter Coll., 1964; M.A., 1966.
- Evelyn Pearlene Vestal Glasrud, Instr., 1963, 1965. B.A., Texas Tech, 1961; M.A., 1964.
- Horace Ernest Griffith, Part-time Instr., 1952. B.A., Texas Tech, 1935; LL.B., Georgetown, 1939.
- J. W. Jackson, Prof., 1929, 1946. B.A., Texas Tech, 1929; M.A., 1929.
- Ralph Gray Jones, Prof., 1965. B.A., Louisiana State, 1935; M.A., 1938; Ph.D., U. of Cambridge (England), 1949.
- Sabe McChain Kennedy, Prof. & V. Pres. for Academic Affairs, 1946, 1966. B.A., Texas Tech, 1943; M.A., 1946; Ph.D., Colorado, 1952.
- Martin Theodore Kyre, Jr., Assoc. Prof., 1963, 1965. B.A., Ohio Wesleyan, 1950; M.A., Washington, 1957; Ph.D., 1962.
- Raymond DeElmont Mack, Assoc. Prof., 1946, 1965. B.A., Texas Christian, 1945; M.A., Texas (Austin), 1949.
- Glenn Douglas McDonald, Assoc. Prof., 1966. B.S., Southern Methodist, 1947; M.A., 1948; Ph.D., Texas (Austin), 1955.
- William Eugene Oden, Prof., 1948, 1955. B.A., Oklahoma, 1946; M.A., 1949; Ph.D., Indiana, 1957.
- James Rendall Ray, Part-time Instr., 1967. B.A., Texas Tech, 1958.
- Jerry Madison Sowder, Part-time Instr., 1955. B.A., Texas Tech, 1949; LL.B., Texas (Austin), 1955.
- Metin Tamkoc,⁴ Prof., 1964, 1966. LL.B., U. of Istanbul, (Turkey), 1950; M.A., Maryland, 1955; Ph.D., Georgetown, 1960.
- William Pierce Tucker, Prof., 1967. B.A., U. of Puget Sound, 1930; M.A., Washington, 1931; Ph.D., Minnesota, 1945.
- Ruth Cowart Wright, Instr., 1957. B.A., Texas Tech, 1948; M.A., 1949.

Teaching Assistants

- Richard Franklin Barrett,¹⁰ 1968. B.A., Texas Tech, 1966.

- William Roddy Daniel, 1966. B.A., Texas Tech, 1968.
- Edwin Sparling Davis, 1967. B.A., North Texas State, 1962; M.A., 1964.
- Elbert Theo Dubose, 1967. B.B.A., Southwest Texas State, 1966.
- Khaled M. Kayali,¹⁰ 1968. B.A., Texas Tech, 1967.
- William Alan Moffitt, 1966. B.A., Texas Tech, 1966.
- Elvin V. Parnell,¹⁰ 1968. A.B., U. of Miami, 1955; M.A., 1967.
- Moses Hyman Perman, 1967. B.A., Tulsa, 1967.
- David Marshall Seaver,²⁰ 1967. B.A., Austin Coll., 1966; M.A., Texas Tech, 1967.
- Don L. Smith, 1965. B.A., Hardin-Simmons, 1962; M.A., Mississippi State, 1964.
- Jerry Lynn Smith, 1967. B.S., West Texas State, 1962; M.A., 1966.
- Barbara Bryan Taylor, 1966. B.A., Texas Tech, 1966.
- Raymond Byers Wells, 1966. B.A., Mississippi State, 1963; M.A., 1965.

Department of Health, Physical Education, & Recreation for Men

- Ramon Walter Kirellis, Chmn. & Prof., 1950. B.S., Illinois 1941; M.S., 1944; P.E.D., Indiana, 1950.
- Richard Anthony Berger, Prof. 1962, 1967. B.A., Michigan State, 1951; M.A., 1956; Ph.D., Illinois, 1960.
- Henry Edsel Buchanan, Assoc. Prof. & Dir., Intramural Sports for Men, 1956, 1967. B.S., Michigan, 1952; M.A., 1953.
- John William Cobb, Jr., Prof., 1958, 1966. B.S., U. of Corpus Christi, 1951; M.Ed., Texas Tech, 1954; P.E.D., Indiana, 1958.
- Norman Gerald Coppedge, Instr. & Freshman Basketball Coach, 1965, 1967. B.S., New Mexico Western, 1960; M.Ed., Texas Tech, 1967.
- Harold Stanley Edgar, Asst. Prof., 1966. B.S., Southern Mississippi, 1956; M.A., 1957.
- Melvin Henry Gruensfelder, Asst. Prof., 1967. B.S., Illinois, 1943; M.S., 1964.
- Willard Maurice Holsberry, Instr. & Asst. Dir., Intramural Sports for Men, 1963, 1964. B.A., Eastern New Mexico, 1962; M.S., 1966.
- David Bruce Jordan, Asst. Prof., 1966. B.S., Springfield Coll., 1960; M.A., Oregon, 1964; Ph.D., 1966.
- James Faber McNally, Asst. Prof. & Swimming Coach, 1952, 1964. B.S., Oklahoma, 1952; M.Ed., Texas Tech, 1957.
- George Rex Philbrick, Prof. & Tennis Coach, 1947, 1961. B.S., Texas Tech, 1939; M.Ed. in P.E., Texas (Austin), 1950.
- Polk Fancher Robison, Part-time Assoc. Prof. & Dir., & Business Mgr. of Athletics, 1942, 1961. B.A., Texas Tech, 1934.
- Herman Brazill Segrest, Prof., 1963, 1965. B.S., North Texas State, 1937; M.S., 1946; M.Ed., Texas A & M, 1955; Ed.D., Baylor, 1962.
- Kal Hill Segrist, Jr., Instr. & Head Baseball Coach, 1964, 1967. B.S., North Texas State, 1962; M.Ed., Texas Tech, 1965.
- Don Lewis Sparks, Part-time Instr. & Athletic Department Trainer, 1953, 1964. B.S., Texas Wesleyan, 1952.
- Edward Dale Strickland, Asst. Prof., 1965, 1967. B.S., Texas Tech, 1963; M.Ed., 1965.

Teaching Assistants

- Gary Holmes Gilliland, 1967. B.S., Texas Tech, 1967.
- Walter Burl Huffman, 1967. B.S., Texas Tech, 1967.
- Don L. Mathus, 1967. B.S., Texas Tech, 1967.
- Quentin Ronald Shortes, 1967. B.S., Texas Tech, 1967.

Department of Health, Physical Education, & Recreation for Women

- Margaret Eileen Wilson, Chmn. & Prof., 1965. 1967. B.S.E., Arkansas, 1944; M.S., 1949; Ph.D., State U. of Iowa, 1960.
- Suzanne deVerse Scruggs Aker, Asst. Prof., 1962, 1965. B.A., Tulsa, 1961.
- Joyce A. Davis Arterburn, Instr., 1959, 1967. B.S. in Ed., Texas Tech, 1954; M.Ed., 1966.
- Betty Ann Wertheimer Tevis Bailey, Asst., Prof., 1966. B.A., B.S., Texas Woman's, 1950; M.A., 1951.
- Mary Ann Murphy Cobb, Asst. Prof., 1959, 1961. B.S.E., Henderson State Teachers Coll., 1951; M.Ed., Texas Tech, 1954.
- Mary Burwell Dabney, Prof., 1952. B.S., Coll. of William and Mary, 1932; M.A., Columbia, 1942; Ed.D., 1951.
- Doris Ann Horton, Prof., 1967. B.S.E., Arkansas, 1953; M.A., Iowa, 1959; Ph.D., 1965.
- Dorothy Beatrice Hoyle, Prof., 1951, 1966. B.S., Texas Woman's, 1940; M.A., 1949; Ph.D., 1966.
- Rita Jeannine McHaney, Asst. Prof., 1966. B.S., Arkansas State, 1965; M.S., 1968.
- Ann Crocker Miller, Asst. Prof., 1962, 1967. B.S., North Texas State, 1955; M.Ed., Texas Tech, 1966.
- Ellen Ruth Morrow, Instr., 1967. B.S., Southwest Texas State, 1958; M.A., Chico State, 1967.
- Colleen Mary O'Connor,⁴ Asst. Prof., 1964. B.S., Texas (Austin), 1960; M.Ed., 1963.
- Mary Lydia Seymour Owens, Assoc. Prof., 1966. B.A., New York State, 1946; M.A., Syracuse, 1950.
- Sue Ava Rainey, Prof., 1945, 1965. B.S., George Peabody Coll., for Teachers, 1922; M.A., Columbia, 1926.
- Patricia Ann Reid, Asst. Prof., 1966. B.F.A., Utah, 1966.
- Peggy Jean Williams, Assoc. Prof., 1962, 1967. B.S., East Texas State, 1950; M.Ed., 1953.

Teaching Assistants

- Anne E. Broussard, 1967. B.S., Sam Houston State, 1966.
- Barbara Ann Lindsay, 1967. B.S., Texas Tech, 1966.
- Patsie E. Ross, 1966. B.S. in Ed., Texas Tech, 1953.

Department of History

- David Martell Vigness, Chmn. & Prof., 1955, 1961. B.A., Texas (Austin), 1943; M.A., 1948; Ph.D., 1951.
- Lowell Lawrence Blaisdell, Prof., 1957, 1963. B.A., Elmhurst Coll., 1941; M.A., Rochester, 1944; Ph.D., Wisconsin, 1949.
- Jacquelin Collins, Assoc. Prof., 1962, 1966. B.A., Rice, 1956; M.A., 1959; Ph.D., Illinois, 1964.
- Seymour Vaughan Connor, Prof. & Editor of College Bulletins, 1953, 1965. B.A., Texas (Austin), 1948; M.A., 1949; Ph.D., 1952.
- Timothy Paul Donovan, Assoc. Prof., 1960, 1963. B.A., Oklahoma, 1949; M.A., 1950; Ph.D., 1960.
- Lawrence Lester Graves,²¹ Prof. & Assoc. Dean of the Graduate School, 1955, 1967. B.A., Missouri, 1942; M.A., Rochester, 1947; Ph.D., Wisconsin, 1954.
- June Edith Hahner, Asst. Prof., 1966. B.A., Earlham Coll., 1961; M.A., Cornell, 1963; Ph.D., 1966.
- James W. Harper, Asst. Prof., 1967. B.A., Marshall, 1963; M.A., 1964.
- William Curry Holden, Prof., 1929. B.A., Texas (Austin), 1923; M.A., 1924; Ph.D., 1928.
- George Roswell Hull, Asst. Prof., 1960, 1965. B.S., Moorhead State, 1939; M.B.A., Chicago, 1949; M.A., Texas Tech, 1963.

- William Rudolph Johnson, Asst. Prof., 1964. B.S., Houston, 1958; M.A., 1959; Ph.D., Oklahoma, 1963.
- Allan James Kuethe, Asst. Prof., 1967. B.A., Iowa, 1962; M.A., Florida, 1963; Ph.D., 1967.
- Thomas Green Manning, Prof., 1956, 1961. B.A., Yale, 1936; Ph.D., 1941.
- Otto Millard Nelson, Asst. Prof., 1965. B.S., Oregon, 1956; M.A., 1961.
- Benjamin Havelock Newcomb, Asst. Prof., 1964. B.A., Haverford Coll., 1960; M.A., Pennsylvania, 1961; Ph.D., 1964.
- William Martin Pearce, Prof. & Executive V. Pres., 1936, 1966. B.A., Southern Methodist, 1935; M.A., Texas Tech, 1937; Ph.D., Texas (Austin), 1952.
- James Verdo Reese, Assoc. Prof., 1962, 1966. B.A., Rice, 1957; M.A., Texas (Austin), 1961; Ph.D., 1964.
- George Stiegler Robbert, Assoc. Prof., 1962, 1966. B.A., Concordia Seminary, 1945; B.D., 1948; S.T.M., 1949; M.A., Cincinnati, 1952; Ph.D., Indiana, 1964.
- Louise Buenger Robbert, Part-time Asst. Prof., 1962, 1964. B.A., Carleton Coll., 1947; M.A., Cincinnati, 1948; B.Ed., 1949; Ph.D., Wisconsin, 1955.
- Jay Thomas Roe, Instr., 1967. B.A., Texas (Austin), 1963; M.A., Duke, 1965.
- Frank Rankin Simpson, Instr., 1964, 1967. B.S., Texas Tech, 1961; M.A., 1966.
- Van Mitchell Smith, Prof., 1959, 1967. B.A., Texas (Austin), 1939; M.A., 1940; Ph.D., 1949.
- Francis Hamilton Thompson, Instr., 1965, 1967. B.S., North Texas State, 1952; M.Ed., 1956.
- Idris Rhea Traylor, Jr., Asst. Prof. & Deputy Dir., ICASALS, 1960, 1967. B.A., Texas (Austin), 1957; M.A., 1959; Ph.D., Duke, 1965.
- Ernest Wallace Horn Prof., 1936, 1967. B.S., East Texas State, 1932; M.A., Texas Tech, 1935; Ph.D., Texas (Austin), 1942.
- Paul Joseph Woods, Prof., 1960, 1967. B.A., Illinois, 1938; M.A., 1940; Ph.D., 1941.

Teaching Assistants

- John Robert Abshire, 1966. B.A., Texas Tech, 1962; M.A., 1966.
- William Clyde Billingsley, 1967. B.A., Texas Tech, 1961; M.A., 1967.
- Rondel Van Davidson, 1966. B.A., McMurry Coll., 1962; M.A., Texas Tech, 1967.
- Nelson DeLavan, 1963. B.A., Texas Tech, 1963.
- Fane Downs, 1966. B.A., Texas Tech, 1957; M.A., 1963.
- Victor Kenneth Dugas, 1967. B.A., Southwestern, 1965; M.A., Louisiana, 1967.
- Earl H. Elam, 1967. B.A., Midwestern, 1961; M.A., Texas Tech, 1967.
- Jack Wayne Gibson, 1967. B.A., Texas Tech, 1967.
- Bruce Alden Glasrud, 1963. B.A., Luther Coll., 1962; M.A., Eastern New Mexico, 1963.
- Kenneth Dewey Hairgrove, 1966. B.A., Stephen F. Austin State, 1960; M.A., 1965.
- Barbara Ruth Blackburn Hays, 1966. B.A., Southwestern (Kansas), 1965.
- Ewell James Hindman, 1967. B.A., Texas Tech, 1966.
- Bill Robert Hughes, 1967. B.S., Eastern New Mexico, 1966; M.A., 1967.
- Kenneth Ray Jolly, 1966. B.A., Texas Tech, 1965; M.A., 1967.
- John Garrett Kelly, 1967. B.A., Texas Tech, 1966.
- Winston Lee Kinsey, 1966. B.A., Baylor, 1964; M.A., 1965.
- Geraldine Thorup Kline, 1965. B.A., Utah, 1963; M.A., 1965.
- Paul Dean Lack, 1968. B.A., McMurry, 1966.
- Edward Lonnie Langston, 1967. B.A., Texas Tech, 1960; M.A., 1967.
- Duncan Glenn Muckelroy, 1967. B.A., Texas (Austin), 1964; M.A., 1966.

- Lynn Ray Musslewhite, 1967. B.A., Abilene Christian, 1961.
- Neil Gary Sapper, 1967. B.A., Denver, 1963; M.A., Eastern New Mexico, 1965.
- Jimmy Marion Skaggs, also Asst. Archivist, Southwest Collection, 1965, 1967. B.S., Sul Ross State, 1962; M.A., Texas Tech, 1965.
- Robert E. Zeigler, 1967. B.S., Sam Houston State, 1963; M.A., 1965.

Department of Journalism

- Wallace Earl Garets, Chmn. & Prof., 1956, 1957. B.S., Idaho, 1938; M.S., 1947.
- Charles Laurel Allen, Prof., 1967. B.A., North Dakota, 1924; M.A., Illinois, 1927; Ph.D., Northwestern, 1947.
- William Frank Dean, Part-time Instr. & Dir. Student Publications, 1967. B.B.A., Texas Tech, 1961; M.Ed., 1965.
- Tanner Laine, Part-time Instr., 1966. B.A., Texas Tech, 1939.
- Robert Alan Rooker, Asst. Prof., 1963. B.A., Texas Tech, 1958; M.A., 1960.
- Ralph Louis Sellmeyer, Assoc. Prof., 1960, 1966. B.J., Missouri, 1950; M.A., Missouri (Kansas City), 1951.

Department of Mathematics

- Patrick Lowry Odell, Chmn. & Prof., 1966. B.S., Texas (Austin), 1952; M.S., Oklahoma State, 1958; Ph.D., 1962.
- All Reza Amir-Moez, Prof., 1965. B.A., U. of Teheran (Iran), 1942; M.A., California (Los Angeles), 1951; Ph.D., 1955.
- Ronald Myles Anderson, Assoc. Prof., 1965, 1966. B.A., Luther Coll., 1957; M.S., Iowa State, 1959; Ph.D., 1962.
- Thomas Andrew Atchison, Assoc. Prof., 1967. B.A., Texas (Austin), 1959; M.A., 1960; Ph.D., 1963.
- John Willard Ault, Assoc. Prof., 1965. B.S., Bowling Green State, 1932; M.A., Ohio State, 1935.
- George Lewis Baldwin, Assoc. Prof., 1966. B.S., Eastern New Mexico, 1948; M.A., 1952; Ph.D., Oklahoma, 1961.
- Thomas L. Bouillon, Asst. Prof., 1967. B.S., Louisiana State, 1961; M.S., Southwestern Louisiana, 1963; Ph.D., Texas (Austin), 1966.
- Ila Mae Carpenter, Instr., 1956. B.S., East Texas State, 1942; M.S., Texas Tech, 1952.
- John Walter Duke, Asst. Prof., 1966. B.A., North Texas State, 1959; M.S., Texas Tech, 1961.
- Wayne Timothy Ford, Assoc. Prof., 1967. B.A., Oklahoma City U., 1952; M.A., Oklahoma, 1953; Ph.D., Rice, 1964.
- Gordon Fuller, Prof., 1950. B.A., West Texas State, 1926; M.A., Michigan, 1928; Ph.D., 1933.
- Earl Howard Gilmore, Assoc. Prof., 1958, 1961. B.S., Texas Tech, 1943; M.S., 1947; Ph.D., California (Berkeley), 1951.
- Henry Luther Gray, Assoc. Prof., 1967. B.S., Texas Tech, 1959; M.S., 1961; Ph.D., Texas (Austin), 1966.
- Michael Henry Hall, Asst. Prof., 1967. B.S., Massachusetts Inst. of Technology, 1962; M.S., Arizona, 1963; Ph.D., 1966.
- Emmett Allen Hazlewood, Prof., 1939, 1948. B.S., West Texas State, 1928; M.A., Cornell, 1931; Ph.D., 1936.
- Ellis Richard Heineman, Prof., 1928, 1947. B.A., Wisconsin, 1925; M.A., 1926.
- Shelby Keith Hildebrand, Assoc. Prof., 1963, 1965. B.A., North Texas State, 1952; M.A., 1957; Ph.D., Iowa State, 1962.
- George Seth Innis, Assoc. Prof., 1967. B.A., Texas (Austin), 1958; M.A., 1961; Ph.D., 1962.
- Sarah Ann Nix Kennedy, Instr., 1958, 1961. B.S., Texas Tech, 1957; M.S., 1959.
- Truman Orville Lewis, Asst. Prof., 1966. B.S., Texas Tech, 1956; M.S., 1960; Ph.D., Texas (Austin), 1966.

- Lillian Etta McGlothlin, Asst. Prof., 1947, 1959. B.A., Texas (Austin), 1931; M.A., 1939.
- Jerry E. Mann, Instr., 1967. B.A., Texas (Austin), 1960; M.S., Arkansas, 1966.
- William Lloyd Mathis, Part-time Instr., 1967. B.S., Oklahoma State, 1965; M.S., 1966.
- Billy Eugene Milner, Instr., 1967. B.S., Coll. of Emporia, 1961; M.S., Kansas State Teachers Coll., 1962; M.A., Illinois, 1965.
- Harold Willis Milnes, Prof., 1966. M.A., Wayne State, 1952; Ph.D., 1955.
- Arunkumar Mitra, Visiting Asst. Prof., 1967. B.S., St. Xavier's Coll., Calcutta U. (India), 1955; M.S., 1957; Ph.D., Universitat Marburg (Germany), 1963.
- Robert A. Moreland, Asst. Prof., 1953, 1959. B.S., Texas Tech, 1953; M.S., 1954.
- Elwyn Wade Morton, Asst. Prof., 1955, 1962. B.S., West Texas State, 1949; M.A., Texas (Austin), 1955.
- Thomas Gerald Newman, Asst. Prof., 1967. B.A., Howard Payne, 1962; M.A., Texas (Austin), 1964; Ph.D., 1967.
- Robert Marshall Parker, Assoc. Prof., 1946, 1957. B.A., Texas Tech, 1930; M.A., 1933.
- Robert Leroy Poe, Assoc. Prof., 1966. B.S., Black Hills Teachers Coll., 1951; M.S., Oklahoma State, 1957; Ed.D., 1962.
- George Douglas Poole, Instr., 1967. B.S.E., Kansas State Teachers Coll., 1964; M.S., Colorado State U., 1966.
- Ruby Stewart Power, Instr., 1956, 1957. B.S. in T.E., Texas Tech, 1944; M.S., 1957.
- Samuel E. Rhoads, Instr., 1967. B.A., Western State Coll., 1962; M.S., Wyoming, 1965.
- Fred Dunford Rigby, Asst. Prof. & Asst. V. Pres. for Academic Affairs, 1940, 1968. B.A., Reed Coll., 1935; M.S., State U. of Iowa, 1938; Ph.D., 1940.
- Charles Lathan Riggs, Prof., 1953, 1960. B.A., Texas Christian, 1944; M.A., Michigan, 1945; Ph.D., Kentucky, 1949.
- Virginia Bowman Roberts, Asst. Prof., 1945, 1957. B.A., Texas Tech, 1943; M.A., 1945.
- Charles Dale Scott, Instr., 1958. B.A., Ouachita Baptist Coll., 1924; M.S., Oklahoma State, 1933.
- Mary Jane Guinn Shipley, Instr., 1961. B.A., Baylor, 1945; M.A., Texas Tech, 1961.
- Gerald Lynn Shurbet, Asst. Prof., 1956, 1960. B.A., Texas (Austin), 1949; M.S., Texas Tech, 1957.
- Burnett T. Smith, Asst. Prof., 1948, 1959. B.S., Texas Tech, 1942; M.Ed., 1948.
- Mary Ruth Chance Strandmann, Asst. Prof., 1951, 1959. B.A., Southwest Texas State, 1936; M.A., Texas Tech, 1952.
- Paul Edward Thompson, Instr., 1963. B.S., New Mexico, 1960; M.S., 1963.
- Fredde Eugene Tidmore, Asst. Prof., 1967. B.S., Hardin-Simmons, 1962; M.S., Oklahoma State, 1963; Ph.D., 1967.
- Charles Carter Wald, Asst. Prof., 1967. B.S., New Mexico Inst. of Mining & Technology, M.S., Louisiana State, 1964; Ph.D., 1967.
- Derald Dee Walling, Assoc. Prof., 1966. B.S., Iowa State Coll., 1958; M.S., Iowa State U., 1961; Ph.D., 1963.
- John Thomas White, Assoc. Prof., 1965. B.A., Texas (Austin), 1952; M.A., 1953; Ph.D., 1962.
- Carl Hammel Willingham, Asst. Prof., 1955, 1957. B.A., Texas Tech, 1928; M.A., 1932.
- Horace Eugene Woodward, Jr., Assoc. Prof., 1937, 1956. B.A., Texas Tech, 1936; M.A., 1937.
- Jyoti Prakash Basu, 1967. B.S., Presidency Coll. (Calcutta, India), 1955; M.S., U. Coll. of Science (Calcutta), 1958.
- Jonathan Sayer Burton, 1964. B.S., Texas Tech, 1962; M.S., 1966.
- David Allen Bushi, 1967. B.A., Muskingum Coll., 1967.
- Stanley Max Compton, 1967. B.S., Texas Tech, 1957.
- Walter Carl Cooley,¹⁰ 1968. B.S., Texas Tech, 1962.
- Richard Alex Cooper, 1966. B.A., Baylor, 1963; M.A., Texas (Austin), 1966.
- Sterling Gene Crossley, 1966. B.A., Rice, 1963; M.S., Texas Tech, 1966.
- William A. Donnell, 1967. B.A., North Texas State, 1963; M.A., 1966.
- Ronald Eugene Dover,¹⁰ 1968. B.S., Texas (Arlington), 1966; M.A., 1968.
- John Coleman Drummond, Jr., 1966. B.S., Notre Dame, 1966.
- Thomas Burton Eastham, 1967. B.A., Texas Tech, 1967.
- Raymond Erleben, 1967. B.S., Texas Lutheran, 1958; M.S., Texas Tech, 1966.
- Jean Kathleen Francis, 1967. B.A., Texas Tech, 1967.
- Cecil Ralph Hallum, 1966. B.S., Texas Tech, 1966.
- Sam Michael Hergert, 1967. B.S., Texas Tech, 1967.
- Theodore Ho Hsu, 1965. B.S., Cheng Kung U. (Taiwan), 1962.
- Michael Francis Hurt, 1967. B.A., Texas Tech, 1967.
- Dennis Addington Johnston, 1966. B.S., Texas (Arlington), 1965; M.A., Texas (Austin), 1966.
- Glenn Earl Johnston, 1965. B.S., North Texas State, 1955; M.S., Texas Tech, 1961.
- Hoyle Julian, 1967. B.S., East Texas State, 1960; M.S., 1965.
- Arlen Karr,¹⁶ 1967. B.A., Hardin-Simmons, 1967.
- Lee Henry Kennedy, 1961, 1967. B.A., Texas Christian, 1958; M.S., Texas Tech, 1960.
- Nancy Estelle Keyton,¹⁰ 1965, 1968. B.A., Texas Tech, 1965; M.A., 1968.
- Howard Barrow Lambert, 1965, 1967. B.S., Southern State Coll. (Arkansas), 1953; M.Ed., West Texas State, 1957; M.A., Louisiana State, 1962.
- Lyons Herff Lockhart, Jr., 1964. B.S., Texas Tech, 1961; M.S., 1965.
- Ivan McKinney, 1967. B.A., Harding Coll., 1967.
- John Seals McMath, 1966. B.A., Texas A & M, 1966.
- Gerald McWilliams, 1957. B.S., Texas Tech, 1960; M.S., 1965.
- Charles Gairdner Moment, 1967. A.B., Princeton, 1959; M.S., Purdue, 1961.
- Kris Moore, 1966. B.A., Texas (Austin), 1964; M.A., 1966.
- David Lauren Nelson, 1967. B.S., Texas Tech, 1967.
- Shirley Ann Owens, 1967. B.A., Angelo State, 1967.
- Charles Rufus Perry, 1967. B.S., Texas Tech, 1967.
- James Louis Poirot, 1965. B.S., Texas Tech, 1965; M.S., 1967.
- Michael David Pore, 1965. B.A., Texas (Austin), 1964.
- Michael L. Rathban, 1967. B.S., Texas Tech, 1967.
- Roy Farest Reynolds, Jr., 1966. B.S., Texas Tech, 1966.
- Dale Robert Rhoades,¹⁰ 1968. B.A., Texas Tech, 1967.
- Hannah Elizabeth Low Rickman,¹⁶ 1965. B.A., Missouri, 1962; M.S., 1965.
- Richard Lee Sartain, 1967. B.S., Wayland Baptist, 1961; M.S., Iowa, 1964.
- Frederic C. T. Slauson, Jr., 1966. B.S., Texas Tech, 1960; M.S., 1962.
- Harris William Smith, Jr., 1966. B.S., Texas Tech, 1965.

Teaching Assistants

- Carl Wilkerson Ahlers, 1966. B.S., Texas (Austin), 1964; M.A., 1966.
- Roy Dean Alston, 1966, 1967. B.A., Texas (Austin), 1961; M.A., 1964.
- Mary Louise Ballman, 1967. B.A., Wayland Baptist, 1966.

- Rosser Jefferson Smith, III, 1966. B.A., Texas (Austin), 1964; M.A., 1966.
- Shannon Smyrl, 1966. B.S., Texas Tech, 1965; M.S., 1967.
- Garry Dwight Spier,¹⁰ 1968. B.S., Texas Tech, 1968.
- Roland Francis Streit, 1967. B.S., East Texas State, 1965; M.S., 1966.
- Warren Dale Tervoreen, 1967. B.A., North Texas State, 1966.
- Evelyn Joyce Thompson,¹⁶ 1967. B.A., Texas Tech, 1967.
- Joe Barham Thrash, Jr., 1965. B.S., Lamar State Coll. of Technology, 1963; M.S., 1964.
- James Franklin Ward, Jr.,¹⁶ 1966. B.A., Texas Tech, 1965.
- Mary Milam Whiteside,¹⁰ 1965, 1968. B.A., Texas (Austin), 1963; M.A., Texas Tech, 1966.
- Marshall Williams, 1967. B.A., Rice, 1963; M.S., Texas Tech, 1965.
- Jinn Shyong Yeh, 1967. B.S., Cheng Kung U. (Taiwan), 1960; M.S., Kansas State Coll. (Pittsburg), 1967.
- Frank Bertram Griffith, Programmer, 1967. B.S., Texas Western, 1963.

Department of Music

- Gene LeClair Hemmle, Chmn. & Prof., 1949. B.M., Southern Methodist, 1937; M.A., Teachers Coll., Columbia, 1946; Ed.D., 1949.
- Gall Marie Guseman Barber, Part-time Asst. Prof., 1966. B.M., Eastman School of Music, 1959.
- James Joseph Barber, Prof., 1966. B.M., Eastman School of Music, 1958; M.M., 1959; A.M.D., 1964.
- Anthony Norman Brittain, Asst. Prof., 1963. 1967. B.M.E., Florida State, 1959; M.M., Manhattan School of Music, 1963.
- Louis Robert Catugno, Asst. Prof., 1961. 1965. B.M., Yale, 1953; M.M., 1954.
- Dona Lee Cherry,⁸ Part-time Instr., 1967. B.M., Texas (Austin), 1964; M.M., 1967.
- Robert Waldo Deahl, Prof., 1958, 1967. B.M., Oberlin, 1950; M.M., 1952.
- Raymond Pruitt Elliott, Prof., 1950, 1960. B.M., Kansas, 1929; M.S., 1936.
- Paul Raymond Ellsworth, Prof., 1954, 1967. B.A., Hillsdale Coll., 1950; M.A., Teachers Coll., Columbia, 1956.
- John Owen Farrell,⁸ Part-time Instr., 1966, 1967. B.M., Texas Tech, 1966; M.M.E., 1967.
- Arthur Gall Follows, Asst. Prof., 1967. B.M., Oberlin, 1956; M.M., Michigan, 1958.
- Georgette Elizabeth Gettel, Asst. Prof., 1963, 1967. B.M., Northwestern, 1956; M.M., Indiana, 1966.
- Peter Wyeth Hurd, Asst. Prof., 1967. B.M., Syracuse, 1951; M.M., Manhattan School of Music, 1954.
- Virginia Katherine Kellogg, Asst. Prof., 1963, 1966. B.M., Eastman School of Music, 1957; M.M., Illinois, 1961.
- Gene Kenney, Prof., 1957, 1967. B.S., Kansas State Teachers Coll., 1946; M.M., Southern Methodist, 1952.
- Marlin Dean Killion, Prof. & Dir. of Bands, 1959, 1963. B.M.E., Nebraska, 1950; M.M., 1951.
- Doris Davis LaMar, Part-time Instr., 1967. B.M., B.A., U. of Chattanooga, 1958; M.M., Florida State, 1962.
- Frank Richard LaMar, Assoc. Prof., 1966. B.M., Florida State, 1954; M.M., 1955; A.M.D., 1963.
- Carolyn Fay Lancaster,⁸ Part-time Instr., 1966, 1967. B.M., Hardin-Simmons, 1960.
- Charles Alfred Lawrie, Assoc., Prof., 1957, 1965. B.M., Northwestern, 1950; M.M., 1952.
- Joel Thomas Leach, Instr., 1965. B.M.Ed., Michigan State, 1963; M.M.Ed., 1964.

- Sue Tyson Lovett,¹ Instr., 1960, 1966. B.S., Texas Tech, 1949; M.Ed., 1952.
- Darrell Keith McCarty, Prof., 1953, 1967. B.S., Illinois, 1950; B.M., 1950; M.M., 1951.
- Mary Helen McCarty,⁸ Part-time Instr., 1953, 1967. B.M., Indiana, 1949; M.M., 1952.
- Sarah Evelyn McGarrity, Assoc. Prof., 1959, 1967. B.M., Wesleyan Coll., 1948; M.M., Indiana, 1958.
- Thomas Owen Mastrolanni, Assoc. Prof., 1961, 1967. B.S., Juilliard School of Music, 1957; M.S., 1958.
- Judson Dana Maynard, Asst. Prof., 1961. B.M., Montana State, 1951; M.M.E., 1953; Ph.D., Indiana, 1961; Assoc., American Guild of Organists.
- Charles Richard Meek, Instr., 1965. B.M., Oberlin, 1963.
- Dorothy Shelton Nagy,⁸ Part-time Instr., 1966, 1967. B.M., Southern Methodist, 1951; M.A., Texas (Austin), 1958.
- Cheryl Diane Peterson,⁸ Part-time Instr., 1967. B.A., Hope Coll., 1966.
- Jay Peterson, Instr., 1967. B.M., Eastman School of Music, 1965; M.M., 1966.
- Charles William Pest, Assoc. Prof., 1957, 1965. B.M., Colorado State U., 1942; B.S., 1947; M.A., Denver, 1960.
- David George Poutney, Asst. Prof., 1967. B.A., Drew, 1961.
- Irvin Thomas Redcay, Prof., 1966. B.M., Eastman School of Music, 1951; M.M., 1958; A.M.D., 1962.
- Mary Margaret Weeks Redcay,⁸ Part-time Asst. Prof., 1967. B.M., Eastman School of Music, 1957.
- Charles Richard Roe, Instr., 1964. B.M., Baldwin-Wallace, 1963; M.M., Illinois, 1964.
- Betsy Gay King Roe,⁸ Part-time Instr., 1965. B.M.E., Baldwin-Wallace, 1964.
- Benjamin Neal Smith,⁴ Asst. Prof., 1960, 1963. B.M., Eastman School of Music, 1958; M.M., 1959.
- Orlan Earl Thomas, Asst. Prof., 1967. B.M.E., Nebraska, 1957; M.M., 1958.
- Richard Earl Tolley, Assoc. Prof., 1959, 1967. B.S., Illinois, 1955; M.S., 1959.
- Mary Jeanne van Appledorn, Prof., 1950, 1966. B.M., Eastman School of Music, 1948; M.M., 1950; Ph.D., 1966.
- Mary Ann Vaughan, Asst. Prof., 1967. B.M.E., Eastern New Mexico, 1955; M.M., Arizona, 1966.

Teaching Assistants

- Mary Clare Babin, 1967. B.M., Texas Tech, 1967.
- Sarah Anne Barfield, 1966. B.M., Alabama, 1961.
- Marvin James Harvey, Jr., 1967. B.M.E., Texas Tech, 1967.
- Charlie Zeke Helmer, 1967. B.M., Texas Tech, 1965.
- Emile Louise Pandolfi, 1967. B.M., Texas Tech, 1967.
- Henry David Payne, III, 1967. B.M., Oberlin, 1965.
- Elmer Gene Pickens,⁹ 1966. B.M., Texas Tech, 1966.

Department of Philosophy

- Ivan Lee Little, Chmn. & Prof., also Assoc. Dean of the School of Arts and Sciences, 1946, 1967. B.A., Texas Tech, 1938; M.A., Nebraska, 1940; Ph.D., 1953.
- James Francis Donaldson, Asst. Prof., 1967. Ph.B., Aquinas Inst. of Philosophy, 1959; Ph.Lic., Laval U., 1962; Ph.D., 1964.
- Charles Sidney Hardwick, Asst. Prof., 1960, 1965. B.A., Texas Tech, 1952; M.A., 1959; Ph.D., Texas (Austin), 1967.
- Mary Lou Godbehre Rawlings, Instr., 1965, 1967. B.A., Texas Tech, 1947; M.A., 1965.
- Thomas Bruce Waters, Prof., 1962, 1968. B.A., Kentucky, 1930; M.A., 1932; Ph.D., Ohio State, 1935.

Department of Physics

- Henry Coffman Thomas, Chmn. & Prof., 1958. B.S., Western Kentucky State, 1943; M.S., Vanderbilt, 1948; Ph.D., 1950.
- Kamalaksha Das Gupta, Prof., 1966. B.S., Calcutta U. (India), 1937; M.S., 1940; Ph.D., U. of Liverpool (England), 1952.
- James Wendell Day, Prof., 1946, 1962. B.A., Hardin-Simmons, 1928; M.A., Texas (Austin), 1939.
- Preston Frazier Gott, Assoc., Prof., 1949, 1957. B.S., Texas (Austin), 1944; M.A., 1947.
- David Allen Howe, Asst. Prof., 1963. B.S., Indiana, 1958; Ph.D., 1962.
- Young Nok Kim, Assoc. Prof., 1964. B.S., Seoul National U. (Korea), 1947; M.S., 1949; Ph.D., U. of Birmingham (England), 1957.
- Mohammad Arfin Khan Lodhi, Asst. Prof., 1963. B.S., U. of Karachi (Pakistan), 1952; M.S., 1956; D.I.C., Imperial Coll. (London, England), 1960; Ph.D., U. of London, 1963.
- Glen Alan Mann, Assoc. Prof., 1960, 1964. B.S., Michigan State, 1951; M.S., 1953; Ph.D., 1959.
- Billy Jack Marshall, Assoc. Prof., 1965. B.A., Austin Coll., 1958; M.A., Rice, 1960; Ph.D., 1962.
- Raymond William Mires, Asst. Prof., 1957, 1964. B.S., Texas Tech, 1955; M.S., 1960; Ph.D., Oklahoma, 1964.
- Charles Richard Quade, Assoc. Prof., 1965, 1966. B.S., Oklahoma, 1958; M.S., 1960; Ph.D., 1962.
- Billy Joe Sandlin, Assoc. Prof., 1955, 1959. B.S., East Texas State, 1948; M.S., 1949; Ph.D., Texas (Austin), 1960.
- Edward Teller, Consulting Prof., 1967. Ph.D., U. of Leipzig (Germany), 1930; D.Sc., Yale, 1954 (hon.); LL.D.'s (hon.), Boston Coll., 1961, Seattle, 1962, Cincinnati, 1962; other hon. degrees, Alaska, 1959, Fordham, Southern California, George Washington, St. Louis, and Rochester Inst. of Technology, 1960.

Teaching Assistants

- Syed Naqi Akhter, 1967. B.S., U. of Karachi (Pakistan), 1960; M.S., 1963.
- Benjamin Ripley Archer, 1966. B.A., U. of St. Thomas, 1966.
- Cloves Rinn Cleavelin, 1967. B.S., Central State Coll., 1966.
- Donald Delmar Daniel, 1965. B.S., Texas Tech, 1964; M.S., 1967.
- Mazahir Hasan Khan, 1966. B.S., U. of Karachi (Pakistan), 1961; M.S., 1962.
- Melvin Charles Landers, 1967. B.A., Texas (Austin), 1966.
- Olive Yi Liu,¹⁰ 1963. B.S. Taiwan Christian Coll., 1963; M.S., Texas Tech, 1966.
- Yu Liu, 1966. B.S., Cheng Kung U. (Taiwan), 1960; M.A., Rice, 1966.
- Cecil Alan McClure, 1967. B.S., Texas Tech, 1967.
- James Marshall Minor, 1967. B.S., Texas Tech, 1965; M.S., 1967.
- Randall Mel Parish, 1967. B.S., Texas Tech, 1964.
- Roger Alan Robbins, 1967. B.S., Texas A & M, 1966.
- Joseph Edward Schindler,¹⁰ 1967. B.S., Tulsa, 1964.
- Horton Struve, 1965. B.S., Texas Tech, 1964; M.S., 1966.
- Howard Raeburn Test, II, 1967. B.A., Pan American Coll., 1965.
- Benjamin Thomas Waak, 1965. B.S., Southern Methodist, 1963; M.S., Texas Tech, 1966.

Department of Psychology

- Theodore Andreychuk, Chmn. & Prof., 1962. B.M., Michigan State, 1943; M.A., Redlands, 1951; Ph.D., Texas (Austin), 1954.

- Robert Paul Anderson, Part-time Prof., 1955, 1963. M.A., Chicago, 1951; Ph.D., 1954.
- Dixie Boyd, Instr., 1960. B.A., Texas Woman's, 1933; M.Ed., North Texas State, 1951.
- Sam Lewis Campbell, Assoc. Prof., 1965. A.B., Chapman Coll., 1945; A.M., Indiana, 1952; Ph.D., 1958.
- Deore J. Cannon, Assoc. Prof., 1965. A.B., Georgia, 1950; M.A., 1951; Ph.D., Texas (Austin), 1958.
- Richard Howard Carlson, Asst. Prof., 1966. B.S., Minnesota, 1952; M.Ed., Hawaii, 1953; Ph.D., Minnesota, 1963.
- Aldrena Beatrix Cobb, Prof. & Dir., Rehabilitation Counselor Training Program, 1958. B.S., West Texas State, 1939; M.S., North Texas State, 1950; Ph.D., Texas (Austin), 1953.
- Dennis Clark Cogan, Asst. Prof., 1966. B.S., Wisconsin, 1959; M.A., Missouri, 1964; Ph.D., 1966.
- Joe Winick Darnall, Asst. Prof., 1966. B.A., Baylor, 1958; M.A., 1962; Ph.D., 1966.
- Nathan Robert Denny, Asst. Prof., 1967. B.A., Louisiana State, 1963; M.A., Oregon, 1965; Ph.D., 1967.
- Clay Edwin George, Assoc. Prof., 1967. B.S., Arizona State, 1949; M.A., Arizona, 1953; Ph.D., Houston, 1962.
- Charles Grover Halcomb, Asst. Prof., 1964. B.A., Oklahoma Baptist, 1958; Ph.D., Baylor, 1964.
- Murray R. Kovnar, Prof., 1961. B.S., Long Island U., 1942; M.A., Denver, 1948; LL.B., 1950; Ph.D., 1953.
- James Edward Kuntz, Prof. & Dir., Counseling Center, 1951, 1959. B.S., Fort Hayes Kansas State, 1937; M.S., 1938; Ph.D., Purdue, 1950.
- William Franklin Landers, Asst. Prof., 1967. B.S., Houston, 1962; M.A., 1965.
- Charles Henry Mahone, Assoc. Prof., 1965. B.A., Oklahoma, 1953; M.S., 1954; M.A., Michigan, 1955; Ph.D., 1959.
- Florence Louise Phillips, Part-time Prof. & Dean of Women, 1954, 1964. B.A., Marshall, 1944; M.A., Michigan State, 1946; Ed.D., Indiana, 1958.
- Joseph Bland Bob Ray, Prof., 1963, 1965. B.A., Oklahoma, 1948; M.S., 1949; Ph.D., 1954.
- Ted Theodore Richardson, Asst. Prof., 1967. B.S., Kansas State Coll., 1959; M.S., 1961.
- Arthur Barclay Sweney, Prof., 1962, 1966. B.S., Illinois, 1947; M.S.W., 1949; Ph.D., Houston, 1958.
- Harold David Vialle, Visiting Assoc. Prof., 1959, 1967. B.A., Texas Tech, 1950; M.A., 1957; Ph.D., 1963.
- Richard Lee Wall, Asst. Prof., 1966. B.A., Oklahoma, 1958; Ph.D., 1966.
- John William Worsham, Jr., Instr., 1967. B.S., Trinity, 1959; M.S., 1963.

Teaching Assistants

- Ann Taylorson Bicknell, 1967. A.B., Southern California, 1958.
- Michael Craig Gottlieb, 1966. A.B., Illinois, 1964; A.M., DePaul, 1966.
- Howard Drew Helwig,¹² 1968. B.S., Ohio State, 1967.
- Charles William Keller, 1965. B.S., Northwestern, 1960; M.S., Trinity, 1965.
- Richard Marshall McWhirter, Jr., 1967. B.A., Texas (Austin), 1965; M.A., 1966.
- Thomas Blake Posey,¹² 1968. B.S., Murray State, 1965.
- Steven Bert Schnee, 1965. B.A., Rutgers, 1960.
- Ken-ichi Takemura, 1965. B.Ed., Tokyo U. of Education (Japan), 1959; M.A., 1961.
- James Lawrence Walker, Jr., 1966. B.A., Baylor, 1964.
- Donald Richard Welti,¹⁰ 1966. B.A., Cincinnati, 1954; B.E., 1955; M.Ed., Miami, 1963.

Department of Sociology &

Anthropology

- Winfred George Steglich, Chmn. & Prof., 1957. 1960. B.A., Concordia Seminary, 1942; Dip.Th., 1946; M.A., Texas (Austin), 1945; Ph.D., 1951.
- Walter Joseph Cartwright, Assoc. Prof., 1962, 1965. B.A., Southern Methodist, 1943; B.D., 1946; M.A., Texas (Austin), 1960; Ph.D., 1964.
- Charles Ray Chandler, Asst. Prof., 1966. B.A., North Texas State, 1956; Ph.D., Tulane, 1967.
- Lewis James Davies, Assoc. Prof., 1962. B.A., Texas (Austin), 1947; M.A., 1950; Ph.D., Illinois, 1960.
- Mary Gwen Deardorff, Instr., 1967. B.A., Texas Tech, 1955; M.A., 1967.
- Roy Sylvan Dunn, Assoc. Prof. & Dir., Southwest Collection, 1956, 1963. B.A., Texas (Austin), 1948; M.A., 1951.
- Kenneth Howard Hones, Assoc. Prof., 1967. Ph.D., U. of Vienna (Austria), 1958.
- William Butler Horton, Jr., Asst. Prof., 1966. B.A., Valdosta State, 1958; M.S., Florida State, 1960.
- Richard Orville Keslin, Assoc. Prof., 1964. B.A., Wisconsin, 1952; M.A., 1957; Ph.D., 1961.
- Evelyn Ina Montgomery, Assoc. Prof., 1964. B.S., Kansas State Teachers Coll., 1936; M.S., 1942; Ph.D., Indiana, 1965.
- Mhya Schway Minnis, Prof., 1962, 1965. B.A., Oberlin, 1939; M.A., 1940; Ph.D., Yale, 1951.
- Dennis Edward Poplin, Asst. Prof., 1967. B.S., Utah State, 1962; M.S., 1962; Ph.D., Kentucky, 1965.
- David Rodnick, Prof., 1967. B.S., New York, 1931; M.A., Yale, 1933; Ph.D., Pennsylvania, 1936.
- David Richard Shepherd, Instr., 1965. B.S., Brigham Young, 1963; M.S., 1964.
- Clark Edmondson Wooldridge, Sr.,⁹ Part-time Asst. Prof., 1967. B.A., Texas (Austin), 1953; M.S.W., 1958.

Teaching Assistants

- James Elbert Bearden, 1967. B.A., Texas Tech, 1967.
- Glen Allen Calvert, 1967. B.A., Lamar State Coll. of Technology, 1967.
- Johnny Weldon Carmichael,¹⁰ 1968. B.A., Texas Tech, 1967.
- Ben Michael Crouch, 1966. B.A., Baylor, 1965.
- Robert Tyson Hayley, Jr., 1967. B.A., Midwestern, 1967.

Department of Speech

- Paul Mervile Larson, Chmn. & Prof., 1950. B.S., Kansas State, 1927; M.S., 1930; Ph.D., Northwestern, 1942.
- Clifford Charles Ashby, Prof., 1963, 1967. B.A., Iowa, 1950; M.A., Hawaii, 1953; Ph.D., Stanford, 1963.
- Martha June Bearden, Part-time Instr., 1961, 1965. B.A., Abilene Christian, 1942; M.A., Texas Tech, 1961.

School of Business Administration

Dean & Staff

- Reginald Rushing,²⁸ Interim Dean & Chmn. of the Department of Accounting, also Prof. of Accounting, 1939, 1968. B.A., Southwestern, 1926; M.B.A., Texas (Austin), 1932; Ph.D., 1948; C.P.A.
- George Gail Heather,²⁹ Dean & Prof. of Finance, 1950. B.S., Southwest Missouri State, 1938; M.A., Iowa, 1942; Ph.D., 1946.
- John Charles Gilliam, Acting Assoc. Dean & Prof. of Business Education and Secre-

- Earl William Blank, Visiting Prof., 1967. Ph.B., Chicago, 1922; M.A. in Drama, Carnegie-Mellon, 1930; Ph.D., Denver, 1953.
- Patrice Margaret Gatlin Costello, Assoc. Prof., 1967. B.S., Coll. Misericordia, 1951; M.A., Teachers Coll., Columbia, 1952; Ed.D., Colorado State Coll., 1963.
- Alfred A. Funk, Asst. Prof., 1965. B.S., Oregon, 1949; M.S., 1951; M.A., Washington, 1961; Ph.D., 1965.
- William Keith Ickes, Prof., 1962, 1965. B.S., Utah, 1948; M.S., 1949; Ph.D., Southern Illinois, 1960.
- Helen Alma Lindell, Asst. Prof., 1948, 1949. B.A., Washburn U. of Topeka, 1924; M.A., Wisconsin, 1945.
- Vernon Ray McGuire, Asst. Prof., 1965. B.A., Wichita State, 1946; M.S., Kansas State, 1950.
- Robert Orlan Miller, Instr., 1966. B.A., Abilene Christian, 1950; M.A., Louisiana State, 1967.
- Ernest Nalle, Visiting Prof., 1961. B.S., Texas (Austin); M.D., Baylor, 1947.
- Robert Dean Olson, Assoc. Prof., 1967. B.A., North Idaho Coll. of Educ., 1950; M.A., Ohio, 1955; Ph.D., Northwestern, 1965.
- Larry Lee Randolph, Asst. Prof., 1966. B.A., Arkansas, 1958; M.A., North Carolina, 1963.
- James Gambrell Robbins,³⁰ Instr., 1962. B.A., Hardin-Simmons, 1945; M.A., Colorado, 1958.
- Ronald Edward Schulz, Prof., 1952, 1967. B.S., Northwestern, 1947; M.A., 1948.
- William Mason Shimer, Instr. & Program Mgr. KTKT-TV, 1965. B.S., Syracuse, 1960; M.A., New Mexico, 1964.
- Vera Lole Jarrard Simpson, Asst. Prof., 1964, 1967. B.A., Texas Tech, 1962; M.A., 1965.
- George F. Swenson, Assoc. Prof., 1967. B.S., Utah State, 1948; M.S., 1949; Ph.D., Southern California, 1956.

Teaching Assistants

- Sally Batson, 1967. B.S., Texas Tech, 1965.
- Lin Allyn Cox, 1967. B.S., Hardin-Simmons, 1967.
- Romola P. Gonzales, 1967. B.S.E., DePauls Coll. (Manila), 1952.
- Julius Arvet Graw, 1966. B.M.E., Texas Tech, 1966.
- Edgar Jackson,³⁰ 1968. B.A., Howard Payne, 1955.
- Mildred Lavern Loving, 1967. B.S., Texas Tech, 1963.
- Gerald Lee Ratliff, 1967. B.A., Georgetown Coll., 1967.
- Ronald David Ray,³⁰ 1968. B.A., Texas Tech, 1968.
- Kenneth Ray Rhymes, 1967. B.S., Sul Ross State, 1967.
- Daniel Mark Sheffield, 1967. B.A., Mercer U., 1967.
- Virginia Swenson, 1967. B.S., Utah, 1945.
- Gail Thomason,³⁰ 1968. B.A., Pan American Coll., 1967.
- Irma Kathryn Wiseman, 1967. B.A., Mercer U., 1967.

- tarial Administration, 1962, 1968. B.A., Western State Coll. of Colorado, 1951; M.B.Ed., U. of Colorado, 1952; Ph.D., Iowa, 1959.

- Seldon C. Robinson, Freshman Adviser (also Asst. Prof. of Management), 1963, 1965. B.S., Sul Ross State, 1935; M.B.A., Texas Christian, 1940; Ed.D., Texas Tech, 1966.
- Patricia Ann Kindred, Administrative Asst., 1964. B.A., Oregon, 1948.

Department of Accounting

- Reginald Rushing**,²⁸ Chmn. & Prof., 1939, 1948. B.A., Southwestern, 1926; M.B.A., Texas (Austin), 1932; Ph.D., 1948; C.P.A.
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- William Norton Baker**, Part-time Instr., 1967. B.B.A., Southern Methodist, 1956; LL.B., 1959.
- Germain Boniface Boer**, Assoc. Prof., 1960, 1964. B.S., St. Edwards U., 1960; M.B.A., Texas Tech, 1961; Ph.D., Louisiana State, 1964; C.P.A.
- Wayne Ralph Chapin**, Assoc. Prof., 1965. B.B.A., Texas (Austin), 1958; M.B.A., 1959; D.B.A., Southern California, 1965; C.P.A.
- Samuel Whitten Chisholm**, Assoc. Prof., 1957. B.B.A., Texas Tech, 1942; M.B.A., 1950; C.P.A.
- Gilford William Cox**, Asst. Prof., 1955, 1956. B.B.A., Texas Tech, 1948; M.S., Texas A & M, 1949; C.P.A.
- Luta Pelham Eaves**, Asst. Prof., 1942. B.B.A., Texas Tech, 1934; M.B.A., 1941.
- Kenneth Lee Fox**, Assoc. Prof., 1966. B.A., Baylor, 1953; M.A., 1960; Ph.D., Illinois, 1966; C.P.A.
- Raymond Ackery Green**, Asst. Prof., 1956, 1960. B.S., Abilene Christian, 1947; M.A., Hardin-Simmons, 1951.
- Carl Stephens Guynes**, Part-time Instr., 1966, 1967. B.B.A., Texas Tech, 1964; M.B.A., 1965.
- Chester Burl Hubbard**, Asst. Prof., 1947, 1967. B.S., Texas Tech, 1947.
- Frank James Imke**, Assoc. Prof., 1967. B.S., Texas (Austin), 1959; M.B.A., 1960; Ph.D., Missouri, 1966; C.P.A.
- Origen Jewett James, Jr.**, Part-time Instr., 1966. B.S., Texas A & M, 1958; M.B.A., 1958.
- Marvin Autry Johnston**, Instr., 1964. B.B.A., Texas Tech, 1963; M.B.A., 1964.
- Philip Warren Ljungdahl**, Asst. Prof., 1966. B.B.A., Texas Coll. of Arts & Industries, 1961; M.S., 1962; Ph.D., Texas (Austin), 1966.
- Jimmie Lee Mason**,¹⁶ Part-time Instr., 1963. B.B.A., Texas Tech, 1952; M.B.A., 1953; C.P.A.
- Fred Wayland Norwood**, Prof., 1951, 1955. B.B.A., Mississippi, 1947; M.B.A., 1948; Ph.D., Texas (Austin), 1951; C.P.A.
- Lorenzo Villa-Real Penafiel**, Part-time Instr., 1967. B.S.C., Far Eastern U., 1948; M.B.A., Texas Tech, 1961; C.P.A.
- Marilyn Elizabeth Gutersloh Phelan**, Instr., 1966, 1967. B.A., Texas Tech, 1959; M.B.A., 1967.
- Robert Byron Price**, Asst. Prof. & Comptroller, 1953, 1967. B.B.A., Texas Tech, 1953; M.B.A., 1961; C.P.A.
- Arthur Theophile Roberts**, Prof., 1955, 1963. B.S. in B.A., Boston Coll., 1950; M.B.A., Boston U., 1951; Ph.D., Louisiana State, 1955; C.P.A.
- A. B. Segars**,¹⁶ Part-time Instr., 1953. B.B.A., Texas (Austin), 1941; M.B.A., 1948; C.P.A.
- Haskell Grant Taylor**, Prof., 1937, 1948. B.B.A., Texas Tech, 1936; M.A., 1937; C.P.A.
- William Elmer Whittington**, Prof., 1947, 1964. B.B.A., Texas (Austin), 1939; M.B.A., 1947; Ph.D., Illinois, 1957.

Teaching Assistants

- George Henry Beeson**, 1967. B.B.A., Texas Tech, 1967.
- Joan Blanscet**, 1967. B.B.A., Texas Tech, 1967.
- Jimmie Michael Bowman**,¹ 1967. B.B.A., Texas Tech, 1966.
- James Robert Browning**,⁹ 1967. B.B.A., Texas Tech, 1967.

- Alvie Neil Burdine**,⁹ 1967. B.B.A., Texas Tech, 1967.
- Audis Alvie Butler**,¹ 1967. B.B.A., Texas (Arlington), 1967.
- Harvey Gene Crowley**, 1967. B.A., Fort Lewis Coll., 1967.
- Claude Lee Daniel**,⁹ 1967. B.B.A., Texas Tech, 1967.
- Lee Aaron Dossey**,¹⁰ 1968. B.B.A., Texas Tech, 1968.
- Richard Wayne Ellis**, 1967. B.B.A., McMurry Coll., 1967.
- Warren William Elsner, Jr.**, 1967. B.B.A., Texas Tech, 1967.
- Andy Baum French**,¹⁰ 1968. B.B.A., McMurry, 1967.
- Eldon Leon Frost**, 1967. B.B.A., Texas Tech, 1967.
- William Thomas Harris, Jr.**, 1967. B.B.A., Texas Tech, 1967.
- Robert Francis Kelly**, 1966. B.S., Villanova, 1966.
- Camille Parrish Koehler**, 1967. B.B.A., Texas Tech, 1967.
- William Robert Koehler**,¹⁰ 1968. B.B.A., Texas Tech, 1967.
- Terry Lynn McWhorter**, 1967. B.B.A., Texas Tech, 1967.
- Gary Hunter Mims**, 1967. B.A., Texas Tech, 1967.
- Samuel Thurston Montgomery**, 1967. B.B.A., Texas Tech, 1967.
- Carlos William Moore**, 1967. B.B.A., Texas (Austin), 1965; M.B.A., Baylor, 1967.
- Joe Louis Murfee, III**, 1967. B.B.A., Texas Tech, 1967.
- Daniel Yayne Parker**, 1967. B.S., Austin Coll., 1962.
- Charles David Ramage**,⁹ 1967. B.B.A., Texas Tech, 1967.
- Jerry Thornton Rogers**,¹ 1966. B.B.A., Midwestern, 1966.
- Phillip Chamberlain Smartt**, 1967. B.A., Texas Tech, 1965.
- Gary Raymond Speer**, 1967. B.B.A., Texas Tech, 1966.
- Donald Moore Springer**, 1967. B. S., Utah, 1964; M.B.A., 1967.
- Harry Lee Stice**,¹⁰ 1968. B.B.A., Texas Tech, 1967.
- William Darwyn Teston**, 1967. B.B.A., Texas Tech, 1967.
- Ronald George Thorn**,¹⁰ 1968. B.B.A., Texas Tech, 1963.
- George Walton Thurston, Jr.**,¹ 1966. B.B.A., Texas Tech, 1966.
- Irwin Welch**,¹ 1967. B.B.A., Texas Tech, 1949; C.P.A.
- Earl Stanley Wilson, Jr.**, 1967. B.S., Texas Tech, 1966.

Department of Business Education & Secretarial Administration

- William Robert Pasewark**, Chmn. & Prof., 1956, 1957. B.S., New York, 1949; M.A., 1950; Ph.D., 1956.
- Irol Whitmore Baisley**, Prof., 1965. A.B., Wayne State, 1933; M.S., Tennessee, 1940; Ed.D., Indiana, 1952.
- John Edward Binnion**, Prof., 1965. B.B.A., Texas (Austin), 1945; M.A., New Mexico Highlands, 1951; Ed.D., Oklahoma State, 1953; C.P.A.
- Leland Dwayne Callaway**, Part-time Instr., 1966. B.B.A., Stephen F. Austin Coll., 1958; M.B.A., East Texas State, 1962.
- Denzel Loren Carmichael**, Prof., 1960, 1967. B.S., Ball State, 1943; M.B.A., Indiana, 1949; Ph.D., Ohio State, 1954.
- Eric Thomas Garman**, Part-time Instr., 1967. B.S. in B.A., Denver, 1964; M.B.A., 1966.
- John Charles Gilliam**,³ Prof., 1962, 1966. B.A., Western State Coll. of Colorado, 1951; M.B.Ed., Colorado, 1952; Ph.D., Iowa, 1959.
- Horace Franklin Griffiths**, Assoc. Prof., 1959, 1967. B.S.C., Texas Christian, 1959;

- M.Ed., Texas Tech, 1960; Ph.D., Michigan State, 1967.
- Ronald Dee Johnson**, Assoc. Prof., 1966. B.A., Washington, 1954; M.B.A., Indiana, 1958; D.B.A., 1966.
- Ernestine Dolores Tuttle Kilchenstein**, Asst. Prof., 1959, 1965. B.B.A., Texas Tech, 1957; M.B.A., 1960.
- Rosemary Pledger**, Part-time Instr., 1967. B.S. Harding Coll., 1947; M.S., Arkansas, 1954.
- Ettie Claire Quicksall**, Asst. Prof., 1945, 1964. B.A., Baylor, 1926; M.A., 1928.
- James Taggart Watt**, Assoc. Prof., 1960, 1965. B.S., Cincinnati, 1950; M.A., Ohio State, 1960; Ph.D., 1965.
- Richard Harold Bethell**,¹³ 1968. B.B.A., Texas Tech, 1968.
- Gail Holmes Burdine**,¹³ 1968. B.B.A., Texas Tech, 1968.

Teaching Assistants

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- Phyllis Loretta Ralston Kinnison**, 1966. B.B.A., Texas Tech, 1966.
- Bettie Frances McQueen**,¹³ 1968. B.B.A., Texas Tech, 1968.
- Beverly Mary Matherne**, 1967. B.S., Nicholls State Coll., 1967.
- Claudia Hopkins Rieken**, 1967. B.S., East Texas State, 1967.
- Chaire Elizabeth Spittler**,⁹ 1967. B.S., Indiana, 1966.

Department of Economics

- Robert Lyle Rouse**, Chmn. & Prof., also Chmn. & Prof., Dept. of Finance, 1950, 1958. B.A., Coe Coll., 1943; M.A., Iowa, 1949; Ph.D., 1950.
- Hugh Allen Anderson**, Assoc. Prof., 1939, 1947, B.A., Hardin-Simmons, 1928; M.A., 1929.
- Vernon Thomas Clover**, Prof., 1947, 1953. B.S., Fort Hays Kansas State, 1934; M.S., 1935; Ph.D., Colorado, 1937.
- John Belton Duncan**, Visiting Asst. Prof., 1967. B.A., Austin Coll., 1959.
- Lewis Edgar Hill**, Prof., 1967. B.A., Texas (Austin), 1947; M.A., 1948; Ph.D., 1957.
- Edna Maynard Gott**, Visiting Instr., 1954, 1966. B.A., Texas (Austin), 1942; M.A., Texas Tech, 1954.
- John Elzie Harding**, Asst. Prof., 1937, 1961. B.A., Howard Payne, 1927; B.F.A., 1927; M.A., Texas Tech, 1937.
- William Scott Hendon**,⁶ Assoc. Prof., 1965. B.A., Oklahoma, 1955; M.A., 1958; Ph.D., 1964.
- Jerry Mike Hood**, Instr., 1966. B.S., Louisiana Polytechnic Inst., 1965; M.B.A., Texas Tech, 1966.
- Thomas Kunhyuk Kim**, Assoc. Prof., 1965. B.A., Berea, 1952; M.B.A., Indiana, 1954; Ph.D., Tulane, 1961.
- Richard Coston Stapleton**, Part-time Instr., 1966. B.S., Texas Tech, 1962; M.B.A., 1966.
- Theodore James Taylor**, Asst. Prof., 1966. B.A., Wichita State, 1961; M.A., Kansas, 1964.
- John Miles Thompson**, Instr., 1966. B.B.A., McMurry Coll., 1965; M.B.A., Texas Tech, 1966.
- Roger Monroe Troub**, Asst. Prof., 1967. B.B.A., Oklahoma, 1962; M.A., 1967.
- Erlinda Tumaneng**, Part-time Instr., 1967. B.S. in Acct., Far Eastern U., 1961; M.B.A., DePaul, 1962.
- Harry Stuart Walker**, Asst. Prof., 1953. B.A., Denver, 1948; M.B.A., 1950.
- John Whittman, Jr.**, Assoc. Prof., 1960, 1965. B.S. in B.C., Southern State Coll., (Ark-

ansas), 1957; M.B.A., Arkansas, 1959; Ph.D., 1965.

Teaching Assistants

- Tjalling Ament**, 1967. Meeester in de rechten, State U. of Utrecht, 1967.
- Darius John Conger**, 1966. B.S., Texas Tech, 1966.
- Andrew John Dane**, 1966. B.B.A., Texas Tech, 1966.
- Jeremy Atwood Dewick**, 1965, 1966. B.A., Baker, 1965.
- Charles Herbert Fredrickson**, 1967. B.B.A., Texas Tech, 1967.
- Philip Edwin Giffin**, 1967. B.A., Texas (Austin), 1966.
- Ernest Gerhard Harwig**, 1966. B.A., Austin Coll., 1966.
- Robert Hirschman**, 1967. B.B.A., Texas Tech, 1967.
- August Kay Holtkort**, 1967. B.A., Texas Tech, 1967.
- Thomas Julian Lombardo**, 1966. B.A., Texas Tech, 1966.
- Stanley William Newding**, 1967. B.A., Texas Tech, 1966.
- Lawrence B. Wood**, 1967. B.A., Texas Tech, 1967.

Department of Finance

- Robert Lyle Rouse**, Chmn. & Prof., also Chmn. & Prof., Dept. of Economics, 1950, 1958. B.A., Coe Coll., 1943; M.A., Iowa, 1949; Ph.D., 1950.
- Burl Monroe Abel**, Assoc. Prof., 1955. B.S., Oklahoma, 1929; M.B.A., 1931; C.L.U.
- George William Berry**, Assoc. Prof., 1960, 1963. B.B.A., Texas (Austin), 1956; M.B.A., 1957; Ph.D., 1961.
- Oswald Doniece Bowlin**, Prof., 1965. B.A., Texas A. & M., 1951; M.S., 1954; Ph.D., Illinois, 1959.
- Thomas Russell Craddick**,¹ Part-time Instr., 1966. B.B.A., Texas Tech, 1965; M.B.A., 1966.
- Charles Edwin Dale**, Prof., 1955, 1965. B.A., Texas Tech, 1948; LL.B., Baylor, 1950.
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- Dane Everton**, Part-time Instr., 1965. LL.B., Texas (Austin), 1964.
- Don Lamar Harris**, Part-time Instr., 1965. B.B.A., Texas Tech, 1954.
- George Gail Heather**,²⁰ Prof., 1950. B.S., Southwest Missouri State, 1938; M.A., Iowa, 1942; Ph.D., 1946.
- William Thomas Holleman**, Asst. Prof., 1966. B.B.A., Sam Houston State, 1963; LL.B., Southern Methodist, 1966.
- Russell Briggs Irvin**, Part-time Instr. & Consultant, 1951, 1952. B.A., Hardin-Simmons, 1929; M.A., Texas (Austin), 1933; LL.B., 1938.
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- Carrol Ray McGinnis**, Instr., 1966. B.B.A., Texas Tech, 1965; M.B.A., 1966.
- Harold Dean Shuman**, Part-time Instr., 1959. B.A., Washburn U. of Topeka, 1954; LL.B., 1954.
- Lewis Preston Terrell**, Part-time Instr., 1966. B.A., Texas Tech, 1949; M.Ed., 1952; LL.B., Texas (Austin), 1966.
- Charles Ernest Wade**, Asst. Prof., 1955. B.B.A., Texas (Arlington), 1961; M.B.A., North Texas State, 1962; Ph.D., Oklahoma, 1966.
- Robert John Wade, Jr.**, Asst. Prof., 1964. B.S. in Bus., Indiana, 1960; LL.B., Michigan, 1963.

Teaching Assistants

- David Sterling Barnard, 1967. B.S., Texas Tech, 1967.
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 Robert Shepherd Hayes,¹⁰ 1966. B.B.A., Texas Tech, 1966.
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 Charles Milton Milka,¹⁰ 1968. B.B.A., Texas Tech, 1968.
 Pedro Martinez Navarro, 1967. Ingeniero Industrial, U. of Barcelona (Spain), 1966.
 Andrew Joseph Senchack, 1967. B.S. in I.E., Texas Tech, 1966.
 Virgil Leon Thomas,¹⁰ 1968. B.B.A., Texas Tech, 1968.
 Edwin Gray Young, Jr., 1967. B.B.A., Texas Tech, 1967.
 Bobby Gene Youree,¹ 1967. B.B.A., Texas Tech, 1967.

Department of Management

- Vincent Peter Luchsinger, Chmn. & Assoc. Prof., 1961, 1967. B.A., Loras Coll., 1949; M.A., Texas Tech, 1959; Ph.D., 1962.
 Robert Sexton Adams, Assoc. Prof., 1965, 1967. B.B.A., North Texas State, 1958; M.B.A., 1961; Ph.D., Louisiana State, 1965.
 Richard Fleming Barton, Prof., 1967. B.S., Northwestern, 1948; Ph.D., California (Berkeley), 1961.
 William Gaston Cain, Jr., Prof., 1955, 1963. B.S.C., Iowa, 1942; M.A., 1946; Ph.D., 1952.
 Harry Howard Elwell, Jr., Prof., also Prof. of Marketing, 1967. B.B.A., Texas (Austin), 1947; M.B.A., 1949; Ph.D., Illinois, 1960.
 Albert Sidney King, Part-time Instr., 1966. B.B.A., West Texas State, 1962; M.B.A., 1966.
 Robert Thomas Mansker, Part-time Instr., 1966. B.B.A., Texas (Austin), 1965; M.B.A. West Texas State, 1966.
 Kamel Moghrabi, Part-time Instr., 1967. B.S., Marquette, 1961; M.B.A., Bradley, 1963; Ph.D., Texas A & M, 1966.
 Austin Homer Montgomery, Jr., Visiting Asst. Prof., 1967. B.S. in C.E., Texas Tech, 1951; M.B.A., North Texas State, 1956; Reg. Prof. Engr. (Texas).
 Edward Leroy Plumlee, Instr., 1967. B.B.A., Texas Tech, 1962; M.S., Northern Illinois, 1967.
 Louis David Ponthieu, Asst. Prof., 1967. B.B.A., North Texas State, 1962; M.B.A., 1963.
 Forrest Weldon Price, Asst. Prof., 1967. B.S., Tulsa, 1949; M.B.A., Washington, 1953.
 Robert Baldridge Reedy, Part-time Instr., 1954. B.A., Illinois, 1943.
 Seldon C. Robinson, Asst. Prof., 1963, 1965. B.S., Sul Ross State, 1935; M.B.A., Texas Christian, 1940; Ed.D., Texas Tech, 1966.
 John Norman Rogers, Instr., 1966, 1967. B.S., Utica Coll. of Syracuse U., 1959; M.B.A., Texas Tech, 1967.
 Avis Marie Riedinger Ross, Part-time Instr., 1965. B.S., Houston, 1960.
 Richard Ellis Vaden, Part-time Instr., 1966. B.B.A., Texas (Austin), 1960; M.B.A., Texas Tech, 1965.
 Carlton James Whitehead, Assoc. Prof., 1965. B.S., Southeastern Louisiana, 1958; M.B.A., Louisiana State, 1962; Ph.D., 1964.
 Jim Arnold Wlterding, Part-time Instr., 1967. B.A., Seattle, 1962; M.B.A., Oregon, 1965.

Teaching Assistants

- James Earl Blain, 1967. B.B.A., Texas Tech, 1967.
 Stephen Edward Brin, 1967. B.B.A., Texas Tech, 1967.
 David Everton Dibble, 1966. B.S., Texas Tech, 1965.
 Preston Snyder Hallman, III, 1967. B.B.A., Texas Christian, 1967.
 John Harold Jackson, 1967. B.B.A., Texas Tech, 1967.
 Roger Burnham Pierce Rice, 1966. B.A., Texas Tech, 1966.
 Charles Mann Thrash,¹ 1967. B.B.A., Lamar State Coll. of Technology, 1967.
 Kenneth Owen Wilson, 1966. B.B.A., Texas Tech, 1966.

Department of Marketing

- John Allen Ryan, Chmn. & Prof., 1957. B.S., Southern California, 1946; M.B.A., Texas (Austin), 1948; Ph.D., 1957.
 Robert Daniel Amason, Prof., 1963, 1967. B.B.A., Texas A & M, 1951; M.B.A., 1958; Ph.D., Arkansas, 1963.
 Howard Lloyd Baisley, Prof., 1965. A.B., Indiana, 1946; M.A., 1947; Ph.D., 1950.
 John Bruce Clark, Part-time Instr., 1967. A.B., Hamilton Coll., 1957; A.S.A., Bentley Coll. of Accounting and Finance, 1963; M.B.A., Babson Inst., 1963.
 James Joseph Conway, Part-time Instr., 1967. B.S., Massachusetts Maritime Academy, 1949; M.Ed., Boston Coll., 1958; M.B.A., 1963.
 Harry Howard Elwell, Jr., Prof., also Prof. of Management, 1967. B.B.A., Texas (Austin), 1947; M.B.A., 1949; Ph.D., Illinois, 1960.
 Richard McGuire Foster, Instr., 1966. B.B.A., Eastern New Mexico, 1965; M.B.A., 1966.
 Howard Eldon Golden, Prof., 1946, 1965. B.S., West Texas State, 1931; Ph.D., Missouri, 1935.
 Wendell Clark Hewett, Instr., 1963. B.B.A., Texas Tech, 1960; M.B.A., 1961.
 Laura Louise Luchsinger, Asst. Prof., 1954, 1960. B.S. in B.A., Arkansas, 1949; M.B.A., Texas Tech, 1955.
 Robert Donald McWilliams, Instr., 1964, 1965. B.B.A., Texas Tech, 1964; M.B.A., 1965.
 Billy Irvan Ross, Prof., 1964, 1967. B.J., Missouri, 1948; M.A., Eastern New Mexico, 1952; Ph.D., Southern Illinois, 1964.
 John Barney Spalding, Instr., 1964, 1967. B.S., Fort Lewis Coll., 1964; M.B.A., Texas Tech, 1967.
 Charles Roland Vitaska, Part-time Instr., 1967. B.S., Southern Illinois, 1963; M.S., 1965.

Teaching Assistants

- Jeff Michael Biggs, 1967. B.B.A., Texas (Austin), 1966; M.B.A., Texas Tech, 1967.
 Ivan Dean Bishop,¹⁰ 1967. B.B.A., Texas Tech, 1963.
 John Thomas Crain, 1967. B.B.A., Texas Tech, 1967.
 John Doyle, III,¹⁰ 1967. B.B.A., Texas Tech, 1966.
 Leon Floyd Dube,¹⁰ 1968. B.B.A., Texas Coll. of Arts & Industries, 1968.
 Theodore Dudgeon Goldsby, 1967. B.A., Texas Tech, 1967.
 Marshall Eugene Reddick, 1967. B.S., Colorado State U., 1965; M.S., 1967.
 James Michael Sadler,¹⁰ 1968. B.B.A., Texas Tech, 1967.
 Gary Lyn Stevenson, 1967. B.B.A., Texas Tech, 1967.
 James Hal Wilkins, 1966. B.A., Texas Tech, 1966; M.B.A., 1967.
 Andy Wilson, 1966. B.A., Texas Tech, 1966.

School of Education

Dean & Staff

- Glenn E. Barnett,²³ Dean & Prof. of Education, also Executive V. Pres., 1968. B.S. in Ed., Teachers Coll. (Kansas City), 1937; M.Ed., Missouri, 1939; Ed.D., 1943.
- Donald McDonald, Acting Dean & Prof. of Education, 1948, 1967. B.S., North Texas State, 1940; M.S., 1944; Ed.D., Texas (Austin), 1954.
- Julian Lawson Biggers, Jr., Acting Asst. Dean & Assoc. Prof. of Education, 1966, 1967. B.S., East Texas State, 1950; M.Ed., Texas (Austin), 1956; Ph.D., 1966.
- Marym Robinson, Administrative Asst., 1950, 1967. B.A., Texas Tech, 1938.

Department of Education

- Berlie Joseph Fallon, Chmn. & Prof., 1955, 1967. B.A., Daniel Baker Coll., 1942; M.Ed., Texas Tech, 1947; Ed.D., Colorado, 1951.
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- Floyd D. Boze, Part-time Prof. & Dean of Admissions, 1958, 1965. B.S., East Texas State, 1938; M.S., 1938; Ed.D., Tennessee, 1955.
- Owen LaVerne Caskey, Prof., 1947, 1965. B.S., Texas Tech, 1947; M.Ed., 1948; Ed.D., Colorado, 1952.
- Raymond Leon Davidson, Prof., 1949, 1962. B.A., Clarendon Coll., 1927; M.A., Texas Tech, 1935; Ed.D., Texas (Austin), 1951.
- James Rankin Gammill, Assoc. Prof., 1952, 1963. B.S. in Ed., Texas Tech, 1935; M.Ed., 1939; Ed.D., 1956.
- Dwight Louis Kirk, Prof., 1966. B.S., Livingston State Teachers Coll., 1945; M.A., Alabama, 1946; Ed.D., Texas (Austin), 1953.
- Donald McDonald, Prof. & Acting Dean of the School of Education (also Prof. of Elementary Education), 1948, 1967. B.S., North Texas State, 1940; M.S., 1944; Ed.D., Texas (Austin), 1954.
- Maryanne Reid, Asst. Prof. & Dir., Foreign Student Admissions, 1966, 1967. B.S., Northwestern, 1952; M.A., California (Los Angeles), 1955; Ed.D., Texas Tech, 1967.
- Joe Wayne Tidrow, Prof., 1962, 1965. B.S., Central State Coll. (Oklahoma), 1947; M.S., Oklahoma State, 1954; Ed.D., 1957.
- Morris Sheppard Wallace, Prof., 1955. B.A., North Texas State, 1934; M.A., 1938; Ed.D., Teachers Coll. Columbia, 1948.
- Welborn Kiefer Willingham, Asst. Prof., 1961, 1964. B.A., Texas Tech, 1949; M.Ed., Texas (Austin), 1956; Ph.D., Texas Tech, 1964.

Teaching Assistants

- Edwin Jack Chambliss, 1967. B.A., Vanderbilt, 1948; B.A., Mississippi, 1949; M.Mus.Ed., North Texas State, 1955.
- Edward Eugene Lewis, 1967. B.S., Houston, 1949; M.Ed., 1952.

Department of Elementary Education

- Laura Katherine Evans, Acting Chmn. & Prof., 1951, 1967. B.S., Eastern Kentucky State, 1940; M.A., George Peabody Coll. for Teachers, 1946; Ed.D., Maryland, 1965.

- Shirley M. Ahlers, Asst. Prof., 1967. B.A., Southern Methodist, 1958; M.Ed., North Texas State, 1965; Ed.D., 1968.
- Charles Leonard Almsworth, Assoc. Prof., 1967. B.A., Texas Tech, 1953; M.Ed., 1958; Ed.D., 1963.
- Neville Hasso Bremer, Assoc. Prof., 1965. B.A., West Texas State, 1940; M.A., Colorado State Coll., 1946; Ed.D., Houston, 1956.
- Maggie Sue Collier, Instr., 1966, 1967. B.S. in Ed., Texas Tech, 1962; M.Ed., 1965.
- Alex Belcher Crowder, Jr., Asst. Prof., 1965. B.S., Hardin-Simmons, 1950; M.Ed., 1951; Ed.D., North Texas State, 1965.
- Billy Cotton Everton, Assoc. Prof., 1958, 1967. B.S., Texas Woman's, 1940; B.A., 1942; M.Ed., Texas Tech, 1954; Ed.D., 1963.
- Dorothy Jane Filgo, Asst. Prof., 1960, 1962. B.A., Baylor, 1942; M.A., Colorado State Coll., 1950.
- Thomas Brooks Livingston, Prof., 1949, 1958. B.S., North Texas State, 1939; M.S., 1941; Ed.D., Stanford, 1952.
- Donald McDonald, Prof. & Acting Dean of the School of Education (also Prof. of Education), 1948, 1967. B.S., North Texas State, 1940; M.S., 1944; Ed.D., Texas (Austin), 1954.
- Patricia Elaine Brown Marlow,¹² Asst. Prof. & Visiting Asst. Prof. of Applied Arts, 1965, 1968. B.S. in Ed., Eastern Illinois, 1950; M.S. in Ed., St. Cloud State, 1962.
- George Peyton Mecham, Prof., 1951, 1957. B.S., North Texas State, 1928; M.A., Teachers Coll. Columbia, 1933; Ph.D., George Peabody Coll. for Teachers, 1940.
- Fannie Ernestine Pillow, Asst. Prof., 1965. B.S., West Texas State, 1942; M.Ed., Texas Tech, 1952.
- Oliver Boone Wheeler, Assoc., Prof., 1953, 1959. B.A., Howard Payne, 1922; M.A., Texas Christian, 1946; Ed.D., Texas Tech, 1955.

Teaching Assistant

- Raymond Edward Trotter, Jr.,¹⁶ 1967. B.S. in Ed. Ed., East Texas State, 1963; M.Ed. in Ed. Adm., 1965.

Department of Secondary Education

- Holmes Andrew Webb, Chmn. & Prof., 1960, 1967. B.A., Texas Tech, 1930; M.A., 1935; Ed.D., Southern California, 1953.
- Billy Earl Askins, Asst. Prof., 1967. B.S., East Texas State, 1953; M.Ed., Midwestern, 1959; Ed.D., North Texas State, 1967.
- Weldon Earnest Beckner, Asst. Prof., 1965. B.S., Wayland Baptist, 1955; M.Ed., Texas Tech, 1959; Ed.D., Colorado, 1966.
- Mildred Lucille Bettencourt, Asst. Prof., 1950, 1959. B.A., Texas (Austin), 1929; M.Ed., Texas Tech, 1951.
- Nancy Smith Boze, Asst. Prof., 1958, 1966. B.S., East Texas State, 1940; M.A., 1948; Ed.D., Texas Tech, 1966.
- Bessie Spain Cowan, Asst. Prof., 1961, 1963. B.S., Abilene Christian, 1936; M.Ed., Texas (Austin), 1957.
- Bruce Max Evans, Instr., 1967. B.S. in Ed., Abilene Christian, 1959; M.Ed., 1960.
- Clifford Arnold Hardy, Jr., Instr., 1966. B.S., Kansas, 1957; M.Ed., Eastern New Mexico, 1964.
- Panze Butler Kimmel, Asst. Prof., 1964. B.S. in Ed., Texas Tech, 1947; M.M., Texas (Austin), 1949; Ed.D., Texas Tech, 1964.
- Levi Marshall Nagle, Jr., Prof., 1959, 1965. B.A., Florida, 1947; M.Ed., 1949; Ed.D., 1952.
- Charles Wesley Rebstock, Asst. Prof., 1966. B.S., Mankato State, 1947; M.S. in Ed., 1957; Ph.D., Minnesota, 1967.

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Teaching Assistants

Weldon Eugene Day, 1967. B.S., West Texas State, 1951; M.Ed., 1962.

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Department of Special Education

Bruce Douglas Mattson, Chmn. & Prof., 1965, 1967. B.S., Mankato State, 1949; M.S., 1956; Ed.D., Colorado State Coll., 1962.

School of Engineering

Dean & Staff

John Ross Bradford, Dean & Prof. of Chemical Engineering, 1943, 1955. B.S. in Ch.E., Texas Tech, 1942; M.S. in Ch.E., 1948; Ph.D., Case Inst. of Technology, 1953; Reg. Prof. Engr. (Ohio, Texas).

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Sylvia Joy Condrey, Administrative Asst., 1967. Georgiana Conner, Administrative Asst., 1932, 1961. B.A., New Mexico, 1929.

Mary Maxine Daly, Technical Reports Writer, 1960.

Department of Architecture

Nolan Ellmore Barrick, Chmn. & Prof., 1953, 1965. B.A., Rice, 1935; B.S. in Arch., 1936; M.A., 1937; Reg. Arch. (Texas).

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Fred Robert Beasley, Part-time Instr., 1968. Raymond Hector Brognez, Asst. Prof., 1965. B.A., Rice, 1939; B.S., 1940; Bacc. in Arch., Harvard, 1941; Reg. Arch. (Texas).

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Department of Chemical Engineering

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- Hubert Reed Helchelhelm, Assoc. Prof., 1961. B.S., Notre Dame, 1953; M.S., 1956; Ph.D., Texas (Austin), 1962.
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Teaching Assistants

- Peter Craig Bentsen, 1967. B.S. in Ch.E., Texas Tech, 1967.
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- William Floyd Howard, Jr.,¹² 1968. B.S. in Ch.E., Texas Tech, 1966.
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- Charles Ernest Houston,⁴ Prof., 1932, 1957. B.S. in E.E., Texas Tech, 1931; M.A., 1932; Reg. Prof. Engr. (Texas).
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Teaching Assistants

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Department of Industrial Engineering

- Richard Albert Dudek, Chmn. & Prof., 1958. B.S. in M.E., Nebraska, 1950; M.S. in I.E., Iowa, 1951; Ph.D., 1956; Reg. Prof. Engr. (Iowa).
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Teaching Assistants

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Department of Mechanical Engineering

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Department of Petroleum Engineering

- William Lyon Duckert, Chmn. & Prof., 1948. B.S., Oklahoma, 1930; Reg. Prof. Engr. (Oklahoma, Texas).
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Department of Textile Engineering

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School of Home Economics

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Willie Vaughn Tinsley, Dean & Prof. of Home Economics, 1953. B.S., Texas Woman's, 1928; M.S., Colorado State U., 1936; Ph.D., Minnesota, 1947.

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Department of Clothing & Textiles

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Teaching Assistants

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Department of Food and Nutrition

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Department of Home Economics Education

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- Cyllan Mason Skinner Law, Asst. Prof., 1966. B.A., Alabama Coll. 1955; M.A., Mississippi, 1966.
- Donald Sherman Longworth, Prof., 1966. B.S., in Soc., Bowling Green State, 1943; M.A. in Soc., 1947; Ph.D., Ohio State, 1952.
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- Mildred Edith Webb Medlock, Asst. Prof., 1966. B.S., Oklahoma State; 1955; M.S., Texas Tech, 1961.
- John Samuel Phillips, Instr., 1966. B.A., Ouachita Baptist Coll., 1946; B.D., Southern Baptist Theological Seminary, 1949; Th.M., 1951.
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- Helen Caldwell Randle, Assoc. Prof., 1965. B.S., Texas (Austin), 1934; M.S., Colorado State U., 1940.
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Teaching Assistant

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School of Law

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- Glen William Shellhaas, Prof., 1967; A.B., Ohio State, 1941; J.D., 1943.
- Justin Carey Smith, Prof., 1967. B.S. Lawrence, 1950; J.D., Wisconsin, 1954; LL.M., 1959.

Graduate School

Dean & Staff

- Fred Durnford Rigby,²⁶ Dean & Prof. of Mathematics, 1940, 1963. B.A., Reed Coll., 1935; M.S., State U. of Iowa, 1938; Ph.D., 1940.
- Lawrence Lester Graves,²⁷ Assoc. Dean & Prof. of History, 1955, 1967. B.A., Missouri, 1942; M.A., Rochester, 1947; Ph.D., Wisconsin, 1954.

- Robert Lewis Packard, Asst. Dean for Research & Prof. of Biology, 1962, 1967. B.S., Nebraska, 1951; M.A., Kansas, 1955; Ph.D., 1960.
- Billie J. Richardson, Administrative Asst. for Research, 1967.
- Irene Neale Temple, Administrative Asst., 1953, 1959.

Reserve Officers Training Corps

Aerospace Studies (Air Force ROTC)

- Henry Lee Gantz, Jr., Lieutenant Colonel, USAF, Prof., 1963, 1965. B.G.E., Omaha, 1959.
- Robert Dyer, Major, USAF, Asst. Prof., 1964. B.S., North Texas State, 1951.
- Robert L. Paradis, Major, USAF, Asst. Prof., 1965. B.S., U. of Corpus Christi, 1951; M.Ed., Texas Tech, 1967.
- Stephen Von Puhl, Major, USAF, Assoc. Prof., 1965. B.B.A., Baylor, 1951.

Military Science (Army ROTC)

- Maxwell C. Murphy, Colonel, USA, Prof., 1967. B.S., United States Military Academy, 1944; M.A., Virginia, 1948.
- Don E. Brown, Major, USA, Asst. Prof., 1966. B.A., Texas Tech, 1965.
- Bobby J. Carter, Major, USA, Asst. Prof., 1966. B.S., Texas A & M, 1958.
- Kenneth W. Schreiber,³⁰ Major, USA, Asst. Prof., 1968. B.S., Niagara, 1959.
- Gilbert H. Schumpert, Jr., Major, USA, Asst. Prof., 1967. B.S., Oklahoma State, 1960.
- John S. Wilkes, III,³⁴ Major, USA, Asst. Prof., 1967. B.S., United States Military Academy, 1960; M.S., Texas A & M, 1966.

Emeritus Officers of Administration and Faculty

- Clifford Bartlett Jones**, Pres., Emeritus, 1938, 1944. LL.D., Texas Tech, 1940. LL.D.'s (hon.), McMurry, 1939, Texas Tech, 1940, Southwestern, 1941.
- Otto Vincent Adams**, Prof. of Civil Engineering, Emeritus, 1927, 1955; Dean of the School of Engineering, 1932-1949. B.S. in C. and I.E., Colorado State U., 1918; M.S.E., Michigan, 1924; D.Sc. (hon.), Colorado State U., 1945; Reg. Prof. Engr. (Texas).
- Vivian Johnson Adams**, Prof. of Home Economics Education, Emeritus, 1928, 1962. B.S., Southwest Texas State, 1924; M.A., Columbia, 1927.
- Louise Crawford Allen**, Assoc. Prof. of Journalism, Emeritus, 1928, 1963. B.A., Southern Methodist, 1924; M.A., Missouri, 1940.
- Albert Barnett**, Prof. of Education & Prof. of Psychology, Emeritus, 1933, 1965. B.S., George Peabody Coll. for Teachers, 1916; M.A., 1917; Ph.D., 1926.
- Weldon Leroy Bradshaw**, Prof. of Architecture & Allied Arts, Emeritus, 1938, 1966. B.S., Texas A & M, 1924; Reg. Arch. (Texas).
- Charles Victor Bullen**, Prof. of Electrical Engineering, Emeritus, 1932, 1960. B.S. in E.E., Texas (Austin), 1920; M.S. in E.E., Massachusetts Inst. of Technology, 1927; Reg. Prof. Engr. (Texas).
- Warren Perry Clement**, Registrar, Emeritus, 1932, 1961. B.A., Baylor, 1919; M.A., 1920.
- Lewis Briscoe Cooper**, Prof. of Education, Emeritus, 1938, 1965. B.S., North Texas State, 1922; M.A., Texas (Austin), 1926; Ph.D., Cincinnati, 1931.
- William Moore Craig**, Prof. of Chemistry, Emeritus, 1926, 1958. B.A., Southwestern, 1906; M.A., 1907; M.A., Texas (Austin), 1916; Ph.D., Harvard, 1927; Reg. Prof. Engr. (Texas).
- James Cecil Cross**, Prof. of Biology, Emeritus, 1948, 1966. A.B., Southwestern, 1924; M.A., Texas (Austin), 1928; Ph.D., 1931.
- Charles Dudley Eaves**, Prof. of History, Emeritus, 1925, 1959. B.A., Texas (Austin), 1916; M.A., Chicago, 1923; Ph.D., Texas (Austin), 1943.
- Mabel Deane Erwin**, Prof. of Clothing & Textiles, Emeritus, 1926, 1955. B.S., Purdue, 1913; M.A., Teachers Coll., Columbia, 1925.
- Raymond Ernest Garlin**, Prof. of Education, Emeritus, 1927, 1966. B.A., Texas (Austin), 1920; M.A., 1921; Ph.D., 1927.
- William Thomas Gaston**, Business Mgr., Emeritus, 1929, 1955.
- Eunice Joiner Gates**, Prof. of Foreign Languages, Emeritus, 1925, 1963. B.A., Southwestern, 1921; M.A., 1924; M.A., Michigan, 1927; Ph.D., Pennsylvania, 1933.
- William Bryan Gates**, Dean of the Graduate School, Emeritus, 1925, 1963. B.S., Millsaps, 1918; M.A., Vanderbilt, 1921; M.A., Michigan, 1927; Ph.D., Pennsylvania, 1932.
- Carl Henninger**, Assoc. Prof. of Foreign Languages, Emeritus, 1926, 1954. B.A., Indiana, 1907; M.A., Illinois, 1908.
- Cecil Horne**, Prof. & Head of the Department of Journalism, Emeritus, 1926, 1951. B.A., Baylor, 1908; B.A., Yale, 1911.
- William Morley Jennings**, Prof. of Health, Physical Education, and Recreation for Men, Emeritus, 1941, 1966. B.S., Mississippi State, 1912.
- Oscar Arlye Kinchen**, Prof. of History, Emeritus, 1929, 1965. B.A., Oklahoma, 1916; M.A., 1920; Ph.D., Iowa, 1934.
- Florian Arthur Kleinschmidt**, Prof. of Architecture & Allied Arts, Emeritus, 1928, 1966. B.S. in Arch., Minnesota, 1920; M.Arch., Harvard, 1922; Diplôme d'Architecture, U. of Fontainebleau (France), 1925; Reg. Arch. (Texas).
- Milton Frederic Landwer**, Prof. of Zoology, Emeritus, 1927, 1966. B.S., Northwestern, 1920; M.A., Nebraska, 1925; Ph.D., Michigan, 1940.
- Johnnye Gilkerson Langford**, Prof. of Physical Education, Emeritus, 1925, 1955. B.B.A., Texas (Austin), 1924; M.A., Southern California, 1929.
- Seth Shepard McKay**, Prof. of History, Emeritus, 1928, 1965. B.A., Texas (Austin), 1912; M.A., 1919; Ph.D., Pennsylvania, 1924.
- Jonnie McCrery Michie**, Prof. of Food & Nutrition, Emeritus, 1925, 1955. B.S., Columbia, 1920; M.A., 1923.
- Rufus Arthur Mills**, Prof. of English, Emeritus, 1926, 1951. B.A., Texas (Austin), 1914; M.A., 1923.
- Fredis Lloyd Mize**, Prof. of Management, Emeritus, 1946, 1967. B.S., Sul Ross State, 1930; M.Ed., Oklahoma, 1935; Ed.D., 1947.
- James Harold Murchough**, Prof. of Civil Engineering, Emeritus, 1925, 1962. B.S., Massachusetts Inst. of Technology, 1916; M.S.E., Michigan, 1930; Reg. Prof. Engr. (Texas).
- Annah Joe Pendleton**, Prof. of Speech, Emeritus, 1927, 1961. B.A., Texas Christian, 1918; M.A., Iowa, 1931.
- Conner Columbus Perryman**, Prof. of Engineering Drawing, Emeritus, 1929, 1965. B.S., North Texas State, 1926; Reg. Prof. Engr. (Texas).
- Embree Rector Rose**, Prof. & College Physician, Emeritus, 1947, 1965. B.A., Indiana, 1919; M.A., 1922; M.D., 1941.
- Oscar Allen St. Clair**, Prof. of Industrial Engineering, Emeritus, 1934, 1959. B.S., Illinois Inst. of Technology, 1905; Reg. Prof. Engr. (Texas).
- Clarence Carl Schmidt**, Prof. of Physics, Emeritus, 1927, 1964. B.A., Cornell, 1917; M.A., Illinois, 1922; Ph.D., 1927.
- William Mackey Slagle**, Prof. of Chemistry, Emeritus, 1926, 1960. B.A., Southwestern, 1916; M.A., Texas (Austin), 1928.
- Fred Winchell Sparks**, Prof. of Mathematics, Emeritus, 1926, 1951. B.A., Southwestern, 1920; M.A., 1922; M.S., Chicago, 1924; Ph.D., 1931.
- Wenzel Louis Stangel**, Dean of the School of Agriculture, Emeritus, 1925, 1958. B.S., Texas A & M, 1915; M.S., Missouri, 1916; LL.D. (hon.), Texas A&M, 1956.
- Alan Lang Strout**, Prof. of English, Emeritus, 1928, 1961. B.A., Dartmouth, 1918; M.A., Chicago, 1920; M.A., Wisconsin, 1923; Ph.D., Yale, 1925.
- Earl L. Thompson**, Prof. of Mathematics, Emeritus, 1928, 1951. B.A., Kansas State Teachers, 1908; M.A., Kansas, 1914; Ph.D., Chicago, 1928.
- Ralph Sylvester Underwood**, Prof. of Mathematics, Emeritus, 1927, 1961. B.A., Minnesota, 1916; M.A., 1917; Ph.D., Chicago, 1930.
- Thomas Ferdinand Wiesen**, Prof. of Economics, Emeritus, 1940, 1962. B.S., Texas A & M, 1920; M.B.A., Pennsylvania, 1935.
- Warren Watson Yocum**, Prof. of Horticulture, Emeritus, 1937, 1963. B.S., Northeast Missouri State Teachers, 1923; M.A., Missouri, 1927; Ph.D., Nebraska, 1937.

¹ Resigned March 1, 1968.

² Appointed October 16, 1967.

³ On leave fall semester 1967.

- ⁴ On leave 1967-68.
- ⁵ Spring semester 1968.
- ⁶ On leave 1967.
- ⁷ Appointed September 20, 1967.
- ⁸ Appointed September 25, 1967.
- ⁹ Fall semester 1967.
- ¹⁰ Appointed January 1968.
- ¹¹ Appointed October 1, 1967.
- ¹² Appointed January 15, 1968.
- ¹³ Appointed February 1, 1968.
- ¹⁴ Appointed November 1, 1967.
- ¹⁵ Resigned November 30, 1967.
- ¹⁶ Resigned January 1968.
- ¹⁷ Resigned May 31, 1968.
- ¹⁸ Resigned June 1968.
- ¹⁹ Appointed December 1967.
- ²⁰ Resigned December 1967.
- ²¹ Appointed February 11, 1968.
- ²² Appointed August 1968.
- ²³ Appointed July 1, 1968.
- ²⁴ Dean of the School of Agriculture and Prof. of Range Management.
- ²⁵ Interim Executive V. Pres., February-June, 1968.
- ²⁶ Resigned as Dean of the Graduate School April 16, 1968, to become Asst. V. Pres. for Academic Affairs.
- ²⁷ Appointed Interim Dean of the Graduate School April 16, 1968.
- ²⁸ Appointed Interim Dean of the School of Business Administration June 1, 1968.
- ²⁹ Resigned as Dean of the School of Business Administration June 1, 1968.
- ³⁰ Deceased March 17, 1968.
- ³¹ Appointed March 18, 1968.
- ³² Interim Dean of the School of Agriculture, February-June, 1968.

Statistics

Enrollment for the Fall Semester 1967

	Freshmen	Sophomores	Juniors	Seniors	Graduates	Totals
Agriculture	359	323	263	283	96	1,324
Arts and Sciences	2,556	1,414	1,269	973	983	7,195
Business Administration	1,619	990	889	669	283	4,450
Engineering	886	600	450	459	109	2,504
Home Economics	575	369	267	163	35	1,409
Education	526	328	347	211	280	1,692
Law					72	72
TOTALS	6,521	4,024	3,485	2,758	1,858	18,646
Total Men — 11,336				Total Women — 7,310		

Enrollment for the Spring Semester 1968

	Freshmen	Sophomores	Juniors	Seniors	Graduates	Totals
Agriculture	365	318	284	239	113	1,319
Arts and Sciences	2,221	1,372	1,184	844	948	6,569
Business Administration	1,727	1,093	879	587	313	4,599
Engineering	677	502	387	408	114	2,088
Home Economics	528	341	255	136	44	1,304
Education	674	427	441	221	369	2,132
Law					69	69
TOTALS	6,192	4,053	3,430	2,435	1,970	18,080
Total Men — 11,221				Total Women — 6,859		

Enrollment for the Long Session 1967-1968*

	Freshmen	Sophomores	Juniors	Seniors	Graduates	Totals
Agriculture	391	352	295	297	126	1,461
Arts and Sciences	2,771	1,545	1,365	1,030	1,151	7,862
Business Administration	1,870	1,099	957	705	350	4,981
Engineering	934	643	474	472	115	2,638
Home Economics	622	392	284	174	54	1,526
Education	592	364	384	222	449	2,011
Law					72	72
TOTALS	7,180	4,395	3,759	2,900	2,317	20,551
Total Men — 12,496				Total Women — 8,055		

Enrollment for the Summer 1967

FIRST TERM						
	Freshmen	Sophomores	Juniors	Seniors	Graduates	Totals
Agriculture	71	44	83	173	89	460
Arts and Sciences	659	318	704	879	1,298	3,858
Business Administration	316	168	348	533	199	1,564
Engineering	151	112	136	182	97	678
Home Economics	163	41	101	119	81	505
TOTALS	1,360	683	1,372	1,886	1,764	7,065
Total Men — 4,156				Total Women — 2,909		

SECOND TERM						
	Freshmen	Sophomores	Juniors	Seniors	Graduates	Totals
Agriculture	47	44	71	136	67	365
Arts and Sciences	481	275	547	658	855	2,816
Business Administration	224	132	303	396	188	1,243
Engineering	99	103	122	155	82	561
Home Economics	90	42	76	77	72	357
TOTALS	941	596	1,119	1,422	1,264	5,342
Total Men — 3,281				Total Women — 2,061		

Summer Session*

	Freshmen	Sophomores	Juniors	Seniors	Graduates	Totals
Agriculture	86	61	99	197	102	545
Arts and Sciences	808	419	803	977	1,567	4,574
Business Administration	368	209	399	561	250	1,787
Engineering	180	134	153	208	99	774
Home Economics	200	59	117	128	122	626
TOTALS	1,642	882	1,571	2,071	2,140	8,306
Total Men — 4,769				Total Women — 3,537		

* Excluding duplicates.

Attendance, 1925-1967

Year	TERMS				SUMMER TERMS				Totals**
	Fall	Winter	Spring	Long Session*	First Term	Second Term	Summer Session*	Extension	
1925-26	910	897	704	1,043			336		1,379
1926-27	1,378	1,357		1,535			677		2,212
1927-28	1,412	1,401	1,278	1,682	858		965	386	3,033
1928-29	1,810	1,693	1,570	2,088	1,118		1,298	820	4,206
1929-30	2,051	1,917	1,730	2,353	1,139		1,316	1,098	4,767
1930-31	1,983	1,919	1,769	2,319	1,336		1,556	1,227	5,102
1931-32	1,823	1,813	1,669	2,155	1,368	945	1,606	1,011	4,772
1932-33	1,950	1,939	1,758	2,332	1,082	738	1,288	833	4,453

Year	SEMESTERS				SUMMER TERMS				Totals***
	Fall	Spring	Long Session*	First Term	Second Term	Summer Session*	Extension		
1933-34	1,943	2,067	2,361	1,596	1,096	1,970	1,236	5,567	
1934-35	2,433	2,184	2,684	1,549	1,114	1,956	1,403	6,043	
1935-36	2,441	2,338	2,748	1,470	886	1,678	1,522	5,948	
1936-37	2,703	2,591	3,010	1,459	892	1,695	1,255	5,960	
1937-38	3,154	2,998	3,494	1,580	986	1,839	1,067	6,400	
1938-39	3,507	3,335	3,896	1,647	1,069	1,932	1,137	6,965	
1939-40	3,890	3,636	4,246	1,485	1,014	1,800	1,198	7,244	
1940-41	3,797	3,398	4,076	1,298	862	1,522	1,063	6,661	
1941-42	3,549	2,906	3,824	1,376	1,035	1,653	1,050	6,527	
1942-43	2,860	2,166	3,079	980	717	1,140	1,273	5,492	
1943-44	1,696	1,454	1,928	904	705	1,060	1,354	4,342	
1944-45	1,949	1,669	2,222	913	658	1,060	2,084	5,366	
1945-46	2,443	3,220	3,744	2,310	2,011	2,670	1,791	8,205	
1946-47	5,366	5,183	6,096	2,704	2,265	3,067	2,625	11,787	
1947-48	6,114	5,572	6,689	2,728	2,332	3,097	3,059	12,845	
1948-49	6,145	5,760	6,750	2,839	2,315	3,189	3,006	12,945	
1949-50	5,844	5,463	6,511	2,733	2,161	3,127	4,212	13,850	
1950-51	5,475	4,660	6,124	2,310	1,881	2,746	3,627	12,496	
1951-52	4,906	4,554	5,634	1,957	1,547	2,389	3,282	11,305	
1952-53	5,160	4,576	5,885	1,998	1,598	2,422	2,677	10,984	
1953-54	5,418	5,066	6,274	2,124	1,676	2,570	2,838	11,682	
1954-55	6,257	5,859	7,229	2,480	1,947	2,900	3,467	13,596	
1955-56	7,156	6,430	7,992	2,793	2,384	3,286	3,151	14,429	
1956-57	8,055	7,394	9,004	3,049	2,478	3,586	3,808	16,398	
1957-58	8,566	7,739	9,524	3,004	2,472	3,563	4,218	17,305	
1958-59	8,770	7,927	9,787	3,617	2,504	3,945	4,645	18,377	
1959-60	8,866	8,121	9,858	3,661	2,700	4,350	5,061	19,269	
1960-61	9,178	8,682	10,297	4,152	2,774	4,743	5,413	20,453	
1961-62	10,212	9,669	11,419	4,757	3,202	5,534	4,380	21,333	
1962-63	11,183	10,638	12,483	5,169	3,467	5,873	4,818	23,174	
1963-64	12,036	11,676	13,600	5,326	4,125	6,442	4,623	24,665	
1964-65	13,827	13,380	15,457	6,472	4,363	7,462	5,085	28,004	
1965-66	16,305	15,798	17,912	7,344	4,976	8,387	4,843	31,142	
1966-67	17,768	16,917	19,462	7,065	5,342	8,306	4,359	32,127	
1967-68	18,646	18,080	20,551						

Degrees Conferred 1927-1967

SCHOOL OF AGRICULTURE					SCHOOL OF HOME ECONOMICS	
Total Degrees Conferred		3,801			Total Degrees Conferred	2,289
SCHOOL OF ARTS AND SCIENCES					GRADUATE SCHOOL	
Total Degrees Conferred		12,677			Total Masters' Degrees Conferred	4,139
SCHOOL OF BUSINESS ADMINISTRATION					Total Doctors' Degrees Conferred	182
Total Degrees Conferred		6,123			HONORARY DEGREES CONFERRED	33
SCHOOL OF ENGINEERING					TOTAL DEGREES CONFERRED	
Total Degrees Conferred		6,107			1927-1967	35,351

Summary of Degrees Conferred 1927-1967

Total Bachelors' Degrees	30,997	Total Men Receiving Degrees	23,466
Total Masters' Degrees	4,139	Total Women Receiving Degrees	11,881
Total Doctors' Degrees	182		
Total Honorary Degrees	33	GRAND TOTAL	35,351
Total Degrees Conferred	35,351		

* Duplicates excluded.

** Totals of Long Session, Summer Session, and Extension.

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