This Catalog offers information about the academic programs and support services of the University. This Catalog is as accurate as possible, but the information may not remain current for all of the academic year. Circumstances may prompt changes in courses, course content, credit, fees, regulations, semester calendar, curriculum, degrees offered, and other University matters. Such changes authorized by the University apply both to prospective students and to those previously enrolled, unless the latter are specifically exempted.

Equal Educational Opportunity Policy

Oklahoma State University in compliance with Title VI of the Civil Rights Act of 1964 and Title IX of the Education Amendments of 1972 (Higher Education Act) does not discriminate on the basis of race, color, national origin, sex, qualified handicap or disability in any of its policies, practices or procedures. This provision includes, but is not limited to, admissions, employment, financial aid and educational services.
State Regents for Higher Education

J.D. HELMS, Chairman, Oklahoma City
JAMES E. BARNES, Vice-Chairman, Tulsa
GEORGE B. KAISER, Secretary, Tulsa
BOB F. ALLEE, Member, Elk City
ALAN A. BAKER, Member, Duncan
ED LATTA CALHOUN, Member, Beaver
DR. DONALD HALVERSTADT, Member, Oklahoma City
AVALON REECE, Member, Muskogee
GEORGE H. WEYERHAEUSER, JR., Member, Valliant
DR. HANS BRISCH, Chancellor, Oklahoma City

Board of Regents for Oklahoma State University

CAROLYN SAVAGE, Chairman, Hominy
L.E. "DEAN" STRINGER, Vice-Chairman, Oklahoma City
JACK D. CRAIG, Member, Leedey
AUSTIN KENYON, Member, Park Hill
EDWIN KETCHUM, Member, Duncan
ED MALZAHN, Member, Perry
DR. JOHN W. MONTGOMERY, Member, Poteau
ROBERT D. ROBBINS IV, Member, Altus
JIMMIE C. THOMAS, Member, Ada
H. JERRELL CHESNEY, Chief Executive Officer, Shawnee

University Administration

Selected administrators directly responsible for academic and service programs for students.

JOHN R. CAMPBELL, Ph.D., President
JAMES H. BOGGS, Ph.D., Vice-President for Academic Affairs and Research
JERRY B. FARLEY, Ph.D., Vice-President for Business and Finance
RONALD S. BEER, Ph.D., Vice-President for Student Services
J. O. GRANTHAM, M.S., Interim Vice-President for University Relations and Extension
CHARLES E. PLATT, B.S., President, OSU Foundation
CHARLES B. BROWNING, Ph.D., Dean of the College of Agriculture; Director of the Agricultural Experiment Station; and Director of the Cooperative Extension Service
SMITH L. HOLT, Ph.D., Dean of the College of Arts and Sciences
ROBERT L. SANDMEYER, Ph.D., Dean of the College of Business Administration
KENNETH L. KING, Ed.D., Dean of the College of Education and Director of Teacher Education
KARL N. REID, Sc.D., P.E., Dean of the College of Engineering, Architecture and Technology
NORMAN N. DURHAM, Ph.D., Dean of the Graduate College
ELAINE JORGENSEN, Ed.D., Interim Dean of the College of Home Economics
CLYDE B. JENSEN, Ph.D., President of the College of Osteopathic Medicine (Tulsa)
JOSEPH W. ALEXANDER, Ph.D., D.V.M., Dean of the College of Veterinary Medicine
C. DAVID CURTIS, B.S., Bursar
ANTHONY BROWN, Ph.D., Coordinator of Programs, University Center At Tulsa (offices are located in Tulsa)
CHARLES BRUCE, Ph.D., Director of Financial Aid
J. LARRY KEEN, Ed.D., Director of High School and College Relations
ROBIN H. LACY, Ed.D., Registrar and Director of Admissions
EDWARD R. JOHNSON, Ph.D., University Librarian
# Contents

4 Calendar

7 Entering the University

11 Enrollment and Records

12 Costs

15 Financial Aid

16 Student Services

18 Special Programs, Services and Facilities

23 Student Life

25 The Technical Branch, Oklahoma City

25 The Technical Branch, Okmulgee

25 University Academic Regulations

31 Degrees Offered

32 College of Agriculture

40 College of Arts and Sciences

61 College of Business Administration

67 College of Education

76 College of Engineering, Architecture and Technology

90 College of Home Economics

97 College of Osteopathic Medicine

99 College of Veterinary Medicine

101 Faculty

107 The Graduate College

126 Graduate Faculty

145 Course Listings

230 Index
University Calendar

Summer 1989
Regular 8-week Summer Session

May 29, Monday
University holiday
June 1, 2, Thursday, Friday
Registration
June 2, Friday
Last day to cancel enrollment
June 5, Monday
Class work begins
June 9, Friday
Last day to file a diploma application
June 9, Friday
Last day for 80% refund on withdrawal
June 12, Monday
Last day to add
June 16, Friday
Last day for 50% refund on drop or withdrawal
June 23, Friday
Last day to drop or withdraw with "W"
July 4, Tuesday
University holiday
July 7, Friday
Last day to drop with "WP" or "WF"
July 14, Friday
Last day to withdraw with "WP" or "WF"
July 31, Monday
Class work ends (makeup exams)
August 2, Wednesday
Grades due from faculty

First Semester 1989-90, Fall

August 14-18, Monday-Friday
Registration
August 18, Friday
Last day to cancel enrollment
August 21, Monday
Class work begins
August 25, Friday
Last day to enroll
August 25, Friday
Last day to drop a course with no grade
August 28, Monday
Last day to add
September 1, Friday
Last day to file a diploma application
September 1, Friday
Last day for 80% refund on drop or withdrawal
September 4, Monday
University holiday
September 15, Friday
Last day for 50% refund on drop or withdrawal

Second Semester 1989-90, Spring

January 2-5, Tuesday-Friday
Registration
January 5, Friday
Last day to cancel enrollment
January 8, Monday
Class work begins
January 12, Friday
Last day to enroll
January 12, Friday
Last day to drop a course with no grade
January 15, Monday
Last day to add
January 19, Friday
Last day to file a diploma application
January 19, Friday
Last day for 80% refund on drop or withdrawal
February 2, Friday
Last day for 50% refund on drop or withdrawal

Winter Intersession

December 4-8, Monday-Friday
Registration
December 18, Monday
Intersession begins
December 29, Friday
Intersession ends

Second Semester 1989-90, Spring

January 2-5, Tuesday-Friday
Registration
January 5, Friday
Last day to cancel enrollment
January 8, Monday
Class work begins
January 12, Friday
Last day to enroll
January 12, Friday
Last day to drop a course with no grade
January 15, Monday
Last day to add
January 19, Friday
Last day to file a diploma application
January 19, Friday
Last day for 80% refund on drop or withdrawal
February 2, Friday
Last day for 50% refund on drop or withdrawal

February 16, Friday
Last day to drop or withdraw with "W"
February 16, Friday
Last day for 25% refund on drop or withdrawal
March 2, Friday
Progress reports for freshmen due from faculty
March 3, Saturday
Spring break begins
March 12, Monday
Classwork resumes
March 19, Monday
Enrollment for Fall begins
March 23, Friday
Last day to drop with a "WP" or "WF"
April 20, Friday
Last day to withdraw with a "WP" or "WF"
April 23-27, Monday-Friday
Pre-finals week
April 30-May 4, Monday-Friday
Final examinations
May 4, Friday
Class work ends
May 5, Saturday
Commencement
May 9, Wednesday
Grades due from faculty

Summer 1990
Regular 8-Week Summer Session

May 28, Monday
University holiday
May 31, June 1, Thursday, Friday
Registration
June 1, Friday
Last day to cancel enrollment
June 4, Monday
Class work begins
June 8, Friday
Last day to file a diploma application

May 31, June 1, Thursday, Friday
Registration
June 1, Friday
Last day to cancel enrollment
June 4, Monday
Class work begins
June 8, Friday
Last day to file a diploma application

May 30, June 1, Thursday, Friday
Registration
June 1, Friday
Last day to cancel enrollment
June 4, Monday
Class work begins
June 8, Friday
Last day to file a diploma application
First Semester 1990-91, Fall

August 20-24, Monday-Friday
Registration
August 24, Friday
Last day to cancel enrollment
August 27, Monday
Class work begins
August 31, Friday
Last day to drop a course with no grade
September 3, Monday
University holiday
September 4, Tuesday
Last day to add
September 7, Friday
Last day to file a diploma application
September 21, Friday
Last day for 80% refund on drop or withdrawal
October 5, Friday
Last day to drop or withdraw with "W"
October 15, 16, Monday, Tuesday
Fall break
October 17, Wednesday
"Monday" classes will meet
October 19, Friday
Progress reports for freshmen due from faculty
November 2, Friday
Last day to drop with "WP" or "WF"
November 12, Monday
Enrollment for Spring begins
November 22, Thursday
University holiday begins
November 26, Monday
Class work resumes
December 7, Friday
Last day to withdraw with a "WP" or "WF"
December 10-14, Monday-Friday
Pre-finals week
December 17-21, Monday-Friday
Final examinations
December 21, Friday
Class work ends
December 24-January 1, Friday through Tuesday
University holidays
January 4, Friday
Grades due from faculty

Winter Intersession

December 10-14, Monday-Friday
Registration
December 24, Monday
Intersession begins
January 4, Friday
Intersession ends

Second Semester 1990-91, Spring

January 7-11, Monday-Friday
Registration
January 11, Friday
Last day to cancel enrollment
January 14, Monday
Class work begins
January 18, Friday
Last day to enroll
January 18, Friday
Last day to drop a course with no grade
January 21, Monday
Last day to add
January 25, Friday
Last day to file a diploma application
January 25, Friday
Last day for 80% refund on drop or withdrawal
February 8, Friday
Last day for 50% refund on drop or withdrawal
February 22, Friday
Last day to drop or withdraw with "W"
February 22, Friday
Last day for 25% refund on drop or withdrawal
March 8, Friday
Progress reports for freshmen due from faculty
March 9, Saturday
Spring break begins
March 18, Monday
Class work resumes
March 25, Monday
Enrollment for Fall begins
March 29, Friday
Last day to drop with a "WP" or "WF"
April 26, Friday
Last day to withdraw with a "WP" or "WF"
April 29-May 3, Monday-Friday
Pre-finals week
May 6-10, Monday-Friday
Final examinations
May 10, Friday
Class work ends
May 11, Saturday
Commencement
May 15, Wednesday
Grades due from faculty

February 22, Friday
Last day to drop or withdraw with "W"
February 22, Friday
Last day for 25% refund on drop or withdrawal
March 8, Friday
Progress reports for freshmen due from faculty
March 9, Saturday
Spring break begins
March 18, Monday
Class work resumes
March 25, Monday
Enrollment for Fall begins
March 29, Friday
Last day to drop with a "WP" or "WF"
April 26, Friday
Last day to withdraw with a "WP" or "WF"
April 29-May 3, Monday-Friday
Pre-finals week
May 6-10, Monday-Friday
Final examinations
May 10, Friday
Class work ends
May 11, Saturday
Commencement
May 15, Wednesday
Grades due from faculty
The University

Oklahoma State University was founded on December 25, 1890, as Oklahoma Agricultural and Mechanical College, just twenty months after the Land Run of 1889. When the first students assembled for class on December 14, 1891, there were no buildings, no books, and no curriculum.

In 1894, two and one-half years after classes began in local churches, 144 students moved into the first academic building, later known as Old Central, on the southeast corner of campus.

In 1896, Oklahoma A&M held its first commencement with six male graduates.

On July 1, 1957, Oklahoma A&M College became Oklahoma State University. Technical branches were established in Okmulgee in 1946 and in Oklahoma City in 1961. In July 1988, the Oklahoma College of Osteopathic Medicine and Surgery became the College of Osteopathic Medicine of OSU.

As one of Oklahoma’s land-grant institutions, OSU has three goals: instruction, research and extension.

OSU is located in north central Oklahoma in Stillwater, a town of over 42,000, which is almost equally distant from Tulsa and Oklahoma City. The University is coeducational and has an enrollment of over 26,683 students on its four campuses.

The University offers bachelor’s, master’s and doctor's degrees in a large number of fields, as well as the professional Doctor of Osteopathy and Doctor of Veterinary Medicine degrees. Specialist degrees are also offered in selected fields.

Although OSU is a large, comprehensive university, its size does not minimize the personal attention given to each student. The individual is more than just a number at this university. OSU encourages all students, when they first enroll, to identify the college in which they wish to major. Once the student has identified his or her major department, he or she becomes a very important individual to the faculty and advisers of that department. Because the average number of students majoring in any one department is less than 150, the student can count on personal attention in a friendly environment.

The largeness of the University has many distinct advantages. OSU’s 1.5 million volume library, its vast research laboratories and equipment, excellent physical education-recreation and student union facilities, nationally-recognized residence halls programs, outstanding cultural events, and 37 nationally- affiliated fraternities sororities, all provide a stimulating educational and social experience.

The Mission

The mission of Oklahoma State University is to provide an environment in which its constituents can discover, examine, preserve, and transmit knowledge, wisdom, and values that will help ensure the survival of present and future generations, with enrichment in the quality of life.

Student Profile

OSU has a diverse student body. Students come not only from Oklahoma, but from across the nation and world. Of OSU’s 26,683 students, more than 20,500 are on the Stillwater campus, 2,100 at Okmulgee and 3,500 at Oklahoma City, as well as nearly 700 students at the University Center at Tulsa and 300 students at the College of Osteopathic Medicine in Tulsa. Eighty-nine percent of the undergraduate enrollment is from Oklahoma; six percent from other states; and five percent from more than 25 foreign countries. Of the undergraduate population, 55 percent are men and 45 percent are women. Minorities make up eight percent of the undergraduate student body.

The graduate student enrollment totals 4,165. Of these students, approximately 600 enroll through the University Center at Tulsa. Seventy-one percent are from Oklahoma; 12 percent from other states; and 17 percent from foreign countries. Of the graduate population, 56 percent are men and 44 percent are women. Minorities make up eight percent of the graduate student body.

Facilities

The OSU campus is one of exceptional beauty with modified Georgian style architecture in all of the new buildings. The main campus encompasses 415 acres and 200 permanent buildings. These facilities include one of the largest libraries in the entire Southwest, a large Student Union complete with hotel facilities, the Colvin Physical Education Center, the Bartlett Center for the Studio Arts, and the Seretean Center for the Performing Arts.

The Lake Carl Blackwell area, eight miles west of Stillwater, is also owned by OSU. The area includes approximately 21,655 acres, including the 3,000-acre Lake Carl Blackwell which provides the water supply for OSU, and is also used for research activities, in addition to being a popular regional recreational area.

Additional properties include approximately 1,900 acres of farm land and facilities in Payne County, as well as 2,900 acres and various structures devoted to research stations around the state.

General Education

Oklahoma State University is committed to producing graduates who have both a depth of knowledge in their major fields of study and a breadth of knowledge outside their majors, the best graduate being one with a mastery of a specific subject matter and a solid and diversified general education. As a result of this commitment to breadth and general education, the following philosophy of general education was adopted in 1978:

The role of General Education at Oklahoma State University is to assist the student in the pursuit of general knowledge and in the development of skills and attitudes conducive to a lifetime of enlightenment. It must stimulate intellectual curiosity, original thought and expression, the capacity for critical analysis and problem solving and the ability to make conscious value judgments consistent with both personal needs and the public interest. It must be a blend of the timely and the timeless and assist the graduate to live and function in a rapidly changing, complex and cosmopolitan world.

Accreditation

Oklahoma State University has been continuously accredited by the North Central Association of Colleges and Secondary Schools as a degree-granting institution since 1916. It is also a member of the National Association of State Universities and Land-Grant Colleges, the Association of American Colleges and the American Council on Education. The University is on the approved list of colleges and universities of the American Association of University Women. All Teacher Education programs are fully accredited by the National Council for Accreditation of Teacher Education. Many of the colleges and programs are accredited through their professional organizations. These accreditations include: the American Historical Association, the Accrediting Council on Education for Journalism and Mass Communication, the National Association of Schools of Music, the American Speech-Language-Hearing Association, the American Assembly of Collegiate Schools of Business, the National Council for Accreditation of Teacher Education, the Accreditation Board for Engineering and Technology, the Associated Collegiate Schools of Architecture, the National Architectural Accrediting Board, the American Home Economics Association, and the Council on Education of the American Veterinary Medical Association. Refer to the appropriate college sections in this Catalog for information on accreditation of specific programs.

Affirmative Action Program

OSU’s Affirmative Action Program reflects the commitment of the University to equal opportunity and outlines the procedures necessary to fulfill this commitment. OSU is committed by policy of its Board of Regents to promote equal opportunity in all phases of university life for all persons within its constituency. The Affirmative Action Program complies with the legal requirements for federal and state civil rights laws and implements directives. Members of ethnic minority groups, women, the handicapped, disabled veterans, and veterans of the Vietnam era, and the aged in society have faced many complex barriers to equal opportu-
nity in the past. OSU has devised action-oriented programs designed to remove tangible and intangible barriers to equal opportunity, thereby demonstrating through the success of these programs that the goals of equal opportunity held by American society are attainable.

To adequately meet the needs of protected groups, such as the qualified handicapped, self-identification is encouraged on enrollment forms so those eligible can be afforded every opportunity to take advantage of the services offered. All information is protected by privacy laws and used only for affirmative action purposes.

## Entering the University-Admissions

Robin H. Lacy, *Registrar and Director of Admissions*
Gordon L. Reese, *Associate Director*
Darlene Wilson, *Administrative Associate*
Paulette Cundiff, *Coordinator, Admissions Operations*
Margaret Betts, *Coordinator, Freshman Admissions and Enrollment*
Karen R. Mott, *Coordinator, Transfer Credit Evaluations*
Farhat Iltekhuruddin, *Counselor, International Student Admissions*

### Application Procedure

#### When to Apply

Generally, it is advisable to apply for admission several months in advance of the first semester in which enrollment is desired. Applications for Admissions are processed on a "rolling basis," which means admission decisions are usually made and applicants notified within a week or two of receipt of all necessary admission documents.

#### How to Apply

(Nonresidents should include a $10 non-refundable processing fee with the "Application for Admission.")

**First-time Freshmen.** All applicants seeking admission must complete and submit an "Application for Admission." Students should also request that their high school counselor send to the Office of Admissions a current high school transcript that contains the most current class rank and grade-point average (6th, 7th, or 8th semester). In addition, at the time of application, a request should be made to have the results of the ACT or SAT sent to the Office of Admissions, unless such a request was made at the time of testing.

**Transfers.** Students who have enrolled in one or more colleges prior to applying to OSU must complete and submit an “Application for Admission,” and request from the registrar at each college an official transcript of all work attempted be sent to the Office of Admissions at OSU. Students who have earned 23 or fewer hours of college credit should follow the procedure outlined above for first-time freshmen.

**Former Students.** Students who have attended OSU but did not enroll in the immediate past semester (summer sessions are not included), must complete an "Application for Readmission." Students who have enrolled in another college since attending OSU must submit official transcripts of all work attempted.

### Residential Life

**All freshmen (with the exception of commuting students) live on campus their first year.** The University offers a variety of living and food service arrangements to satisfy most students. A Residential Hall Application is included in the "Application Packet" and should be submitted early in the senior year to insure a first-choice assignment. Opportunities abound for transfer students who desire to experience life on campus.

### Beginning the Enrollment Process

#### Advance Fee Payment.

After admission is granted, all new freshman and transfer students are required to submit an advance fee payment prior to the beginning of the enrollment process. The fall semester enrollment process for freshmen is completed during several special orientation sessions conducted on campus during the summer. Students need attend only one session and parents are encouraged to participate in this important program.

Transfer and readmission students will receive enrollment information at the appropriate time.

#### Physical Examination.

Prior to the beginning of classes, all new students must present to the OSU Student Health Center, a physical examination report completed by a local or family physician, or a recent equivalent report from a place of employment or the Armed Forces. If the equivalent report is used, the front page of the OSU Medical History and Physical Examination Record must also be completed.

### Residence Classification for Purposes of Admission and Fees

(See also "Admission-Withdrawal" section of the "Academic Regulations.")

The admission requirements to Oklahoma State University vary for residents and for nonresidents of the state; therefore, prospective students should determine their residence status before examining the admissions requirements. Although the following policy statement is not necessarily inclusive of all regulations governing the classifications of resident and nonresident students for the purpose of fee payment, it should, nevertheless be of assistance to most students in determining their residence status. Administration of the state’s residency policy as it applies to Oklahoma State University students is designated to the Office of Admissions. Questions concerning interpretation of the policy should be directed to the admissions director for a ruling.

Regulations governing the residence status of students are the responsibility of the Oklahoma State Regents for Higher Education and apply to all colleges and universities of the Oklahoma State System of Higher Education.

**Basic Principles Governing Residence.**

1. Attendance at an educational institution is interpreted as temporary residence; therefore, a student neither gains nor loses residence status solely by such attendance.
2. A nonresident student attending an Oklahoma college or university on more than a half-time basis is presumed to be in the state primarily for educational purposes.
3. An individual is not deemed to have acquired status as a resident of Oklahoma until he or she has been in the state for at least a year primarily as a permanent resident and not merely as a student. Likewise, an individual classified as a resident of Oklahoma shall not be reclassified as a nonresident until 12 months after having left Oklahoma to live in another state.
4. All married persons shall be treated as equal under this policy. Therefore, each spouse in a family shall establish his or her own residence status on a separate basis.
5. The burden of proof of residence status or domicile shall be upon the applicant. Students filing an appeal for reclassification of his or her residence status shall do so on forms provided or approved by the Oklahoma State Regents for Higher Education. (Some of the various types of evidence that may serve as proof of residence are year-round residence, ownership of property, registration for state general elections, an Oklahoma income tax return for the most recent calendar year, and payment of property taxes.)
6. Initial classification as a nonresident student shall not prejudice the right of a person to be reclassified thereafter for subsequent semesters or terms of enrollment as an Oklahoma resident provided proof of residence can be established.

### Definition of Residence Terms.

**Residents of Oklahoma:** Residents of Oklahoma are those who have lived continuously in the state for at least 12 consecutive months and whose domiciles are in Oklahoma. Students’ domiciles are their permanent homes—the places where they intend to remain and are expected to return. Students can have more than one residence, but only one domicile.

**Independent Persons:** Independent persons are those enjoying majority privileges (are legally emancipated from their parent(s) or guardian) and who are responsible for their own care, custody and support.
Dependent Persons: Dependent persons are those under the care, custody and support of their parent(s) or other legally sanctioned parental surrogates.

Full-time Students: Full-time students are those enrolled in a minimum of 12 credit hours per semester in an academic year, or a minimum of six credit hours during a summer session.

Residence Status Criteria.

Independent Student Criteria: Students who have achieved majority privileges (are 18 years of age or older), can provide adequate proof of independence from parental or legal guardian domicile, and have come to Oklahoma with the intention of establishing domicile, may be granted residence classification at the next enrollment period after the expiration of 12 consecutive months following the establishment of domicile in Oklahoma. Spouses have come to Oklahoma with the intention of establishing domicile, may be granted residence classification at the next enrollment period after the expiration of 12 consecutive months following the establishment of domicile in Oklahoma. Spouses must establish proof of residence on a separate basis.

In addition to the aforementioned criteria, independent students seeking reclassification as residents of Oklahoma must meet the following criteria for the current and immediately preceding year:
1. The student must not have been claimed as an exemption for the state and federal tax purposes by his or her nonresident parent(s).
2. The student must prove self-support as evidenced by having provided the majority of funds for his or her own upkeep.
3. The student must have maintained a continuous residence in Oklahoma for at least 12 months.

Dependent Student Criteria: For the purpose of establishing residence status, the legal residence of dependent students is that of their parent(s) or legally-appointed guardian. Dependent students may become independent through marriage, formal court action, abandonment by parents, or positive actions demonstrating separation from the parent’s domicile. Students who can provide adequate proof of complete emancipation, and have come to Oklahoma with the intention of establishing domicile may be granted residence classification at the next enrollment period after the expiration of 12 consecutive months following the establishment of domicile in Oklahoma.

International Student Criteria: Students who are not citizens of the United States may become eligible for residence status by proving their "permanent resident status" as evidenced by a valid green card. Students who have resided in Oklahoma for at least 12 consecutive months following the issuance of a green card and can provide adequate proof of residence may be eligible for classification as an Oklahoma resident.

Military Personnel: Students enrolled at Oklahoma State University while on full-time active duty in the Armed Forces are considered to be temporary residents in the state; therefore, they neither gain nor lose resident status. Members of the Armed Forces stationed in Oklahoma, their spouses, and dependent children may be admitted without payment of nonresident tuition so long as they continue to be stationed in the state in full-time military service and under military orders.

Requirements for Admission

High School Preparation

One of the goals of Oklahoma’s public education system is to provide quality academic preparation for as many college-bound students as possible. In Oklahoma, each year more than 1,500 high school students make the decision to enter college.

Students with the ability to think clearly, to reason, to apply scientific method, to use language effectively, and to apply knowledge, are those who will become the masters of their destiny in tomorrow’s world. These students should pursue an academically-oriented high school curriculum. Such a course of study will help develop the basic academic skills and knowledge needed for success in college. The basic skills include reading, speaking and listening, mathematics, writing, reasoning and studying. The basic high school subject areas in which these skills can be nurtured are social studies, foreign languages, the arts, English, mathematics and natural sciences.

Curriculum Requirements (Residents and Nonresidents)

All students beginning college work after July 1, 1988 must have completed the following curriculum requirements for admission:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>English (grammar, composition and literature)</td>
<td>4</td>
</tr>
<tr>
<td>History (American history required)</td>
<td>2</td>
</tr>
<tr>
<td>Laboratory science</td>
<td>2</td>
</tr>
<tr>
<td>Mathematics (algebra I and above)</td>
<td>3</td>
</tr>
</tbody>
</table>

It is also recommended that students complete at least four units (years) from the following subjects:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer science</td>
<td>Government</td>
</tr>
<tr>
<td>Economics</td>
<td>Psychology</td>
</tr>
<tr>
<td>Foreign language</td>
<td>Sociology</td>
</tr>
<tr>
<td>Geography</td>
<td>Speech</td>
</tr>
</tbody>
</table>

Oklahoma Residents

Freshman Admission. For the fall or spring semester: to be admissible, students must graduate from accredited high schools, have participated in either the American College Test (ACT) or a similar acceptable standardized test, and satisfied at least one of the following:

1. maintained a four-year high school grade-point average of 3.00 or higher on a 4.00 grading scale, or
2. ranked scholastically among the top one-half of their class; or
3. attained a composite score of 19 or higher on the ACT or a similar acceptable standardized test.

For the summer session: First-time college freshmen who do not meet the requirements listed above may begin their college enrollment during any summer session if they graduate from an accredited high school and participate in either the ACT or a similar acceptable standardized testing program. Summer admission is “probationary,” however, students may be eligible to continue in the fall if they:

1. complete at least six semester hours of course work (not including activity or performance courses), and
2. earn at least a “C” or equivalent in each course.

Special Adult Admission Opportunities.

Adults, 18 years of age or older, who are not high school graduates, whose high school education was interrupted before graduation may be eligible to enroll provisionally as a “special adult” student if:

1. their high school class graduated prior to the date an “Application for Admission” to Oklahoma State University is submitted, and
2. they are considered academically eligible to enroll.

Adults, 18 years of age or older, who have been out of high school for two or more years may be eligible to enroll provisionally as a “special adult” student if they meet the admission requirements for freshmen entering in the fall or spring with the exception of the criterion related to the ACT or a similar acceptable standardized test.

Students admitted as “special adult” students will be on probation for two consecutive semesters. If at the end of that period, satisfactory progress has been maintained according to the retention standards of the University, enrollment may continue as a regular student.

Concurrent Enrollment as High School Students. Senior high school students from accredited high schools may enroll at OSU provisionally as a special student if they:

1. are enrolled in less than a full-time high school load (fewer than six credit courses per semester), as attested in writing by their school principal, and
2. are eligible to complete their high school graduation requirements no later than the spring of their senior year, as attested in writing by their school principal.

Concurrently enrolled students may not enroll in a combined number of high school and college courses per semester that exceeds a full-time college load (19 semester credit hours). For purposes of calculating a work load, one high school credit course is equal to a three semester credit hour course.

High school students who are otherwise eligible to enroll under this policy, may also enroll for a maximum of nine semester hours of credit during the summer following their high school junior year, without the necessity of being concurrently enrolled in high school classes.

Admission with Advanced Standing. Many high school seniors are enrolled in accelerated courses in various fields, and others have mastered subjects in which they may wish to gain credit through examinations, such as algebra, biology, chemistry, English, foreign languages, history, physics and trigonometry. Students who wish
to apply for these examinations should write to the Office of Admissions, during the last semester of their senior year in high school, but not later than April 20. Students who participate in this testing program and who enroll at OSU will have examination papers evaluated by the department in which advanced standing is sought. If the student successfully passes the examination, college credit will be granted in the course and a grade of "P" will be recorded.

**Transfer Admission.** For the purpose of determining admission, a transfer student is one who has earned a minimum of six or more semester hours of college credit. Students with less than six semester hours of college credit must satisfy the criteria for first-time entering freshmen. Students may transfer to Oklahoma State University from within the state system according to the following criteria:

1. Students who would have satisfied the admission requirements for the fall or spring semester as first-time freshmen, but chose to enroll in the summer probation program. (See "Oklahoma Residents Freshman Admission.")

2. Students who would have satisfied the admission requirements for the fall or spring semester and show promise of being able to succeed in the program or curriculum in which enrolled. (See "Special Talents Waivers.")

**Retention Standards.** The standards pertaining to the retention of students pursuing study in undergraduate programs at OSU are:

- 24 to 36 semester hours: 1.60
- 37 to 72 semester hours: 1.80
- 73 or more semester hours: 2.00

**Nonresidents of Oklahoma**

(All nonresidents must include a nonrefundable $10 application fee with their "Application for Admission."

**Freshman Admission.** The admission requirements for students wishing to enroll at OSU from states other than Oklahoma are the same as those that apply to Oklahoma residents. (Students seeking admission must graduate from high schools accredited by the appropriate regional association or accrediting agency within their home state.) Students who do not meet the criteria for fall or spring enrollment, may be admissible through the summer probation program. (See "Oklahoma Residents Freshman Admission.")

**Transfer Admission.** For the purpose of determining admission, a transfer student is one who has earned a minimum of six semester hours of college credit. Students with less than six semester hours of credit must satisfy the criteria for first-time entering freshmen. Students may transfer to Oklahoma State University from outside the state according to the following criteria:

1. Transfer students seeking admission to OSU from colleges or universities accredited by the North Central Association or other regional associations will be given full recognition of their credits earned providing: (a) they are in good standing at the institution from which they are transferring, and (b) they have a cumulative grade-point average of 2.00 or higher (on a 4.00 scale) for all work attempted.

2. Transfer students seeking admission to OSU from colleges or universities not accredited by a regional association may be given full recognition for their credits earned when the credit is appropriate to the students' degree programs and after OSU has validated the courses. Applicants must meet the conditions of (1-a) and (1-b) above, as well as demonstrate satisfactory progress (a 2.00 cumulative GPA on a 4.00 scale) during their initial term of enrollment.

**Alternative Admission Programs**

**Special Talent Waivers.** As authorized by the Oklahoma State System of Higher Education, a number of first-time freshman students, not to exceed five percent of the class, may enroll with the fall semester, by meeting the following:

1. The applicants must meet all criteria contained in the regular institutional admissions policy with the exception of the prescribed academic criteria, and
2. The individual must demonstrate talent or ability in an area such as art, drama, music, etc., or
3. Be educationally or economically handicapped and show promise of being able to succeed in the program or curriculum in which enrolled.

**Opportunity Admission Program.** Students who have not graduated from high school but whose composite score on the ACT places them in the 99th percentile, or whose combined verbal and mathematics scores on the SAT places them at the 99th percentile, may apply for full admission. Admissibility will depend on test scores, evaluation of maturity level, and whether the experience will be in the best interest of the student.

**Pre-engineering (Transfer-Nonresident of Oklahoma).** Engineering is a competitive program; therefore, enrollment preference is given to Oklahoma residents. In addition to the above requirements, a nonresident of Oklahoma applying for admission to pre-engineering must meet requirements determined by the College of Engineering. These requirements may exceed those required for residents of Oklahoma. (See "College of Engineering, Architecture and Technology."

**English Proficiency Requirement.** All new applicants to OSU for undergraduate study for whom English is a second language shall be required to present a score of 500 or above on the Test of English as a Foreign Language (TOEFL), regardless of the number of semesters or terms completed in other institutions.

**Readmission.** A nonresident or an Oklahoma resident who has attended OSU but did not attend OSU the immediate past semester must file an "Application for Readmission." A student who has attended another college or university since last attending OSU must file a transcript of all work attempted after leaving OSU. If the student's grade-point average is above "C" and his or her disciplinary record is satisfactory, he or she will be admitted to OSU.

**International Admission**

**Application Procedure.** For purposes of admission, an international student is defined as "a student who is, or will be, in the United States on a non-immigrant student visa." This specifically refers to the Student (F) and Exchange Visitor (J) visas. All international students are considered nonresident students. The University will process the International Student Application and Financial Guarantee form for undergraduate admission (freshman and transfer) only after all the following items have been submitted:

1. "Application for Admission" and a fee of U.S. $10.00 made payable to OSU.
2. One official or certified true copy of each academic record with a certified English translation. Students enrolled at U.S. institutions may have certified true copies of their foreign records sent by their current institution.
3. Academic records may comprise one or more of the following:
   a. Yearly secondary school records
   b. Year-by-year records from each college or university attended
   c. National examination results
   d. The international student transferring from another U.S. institution with less than 24 semester credit hours needs to send both certified true copies of his or her secondary records and official transcripts from his or her current institution in the United States.
   e. The international student transferring from another U.S. institution with more than 24 semester credit hours in the U.S. need only to have his or her official transcripts from each college or university attended forwarded directly to the Office of Admissions.
   f. An official Test of English as a Foreign Language (TOEFL) score of 500 or above on the examination taken within the last two years.
   g. Documented evidence of financial support.
   h. The University has no financial aid available for international students.
   i. An international student with F visa status transferring from another U.S. institution will have his or her 1-20 processed for transfer by the Office of International Student Services at OSU. The student with J Visa status should contact his or her foreign student advisor at his or her current institution and also the international student admissions counselor at the Office of Admissions at Oklahoma State University prior to making his or her transfer.
   j. The U.S. Immigration and Naturalization Service (INS) rarely allows international students to work during the course of their studies.
in the United States. Thus, international students should not expect to support themselves through employment while attending the University.

**Freshman Admission (International Students).** (See "Application Procedure" above.)

**Transfer Admission (International Students).**

An international student is considered a transfer student under the following criteria:

1. A student who has attended a post-secondary institution in his or her own country or another international country; or
2. A student who has earned a minimum of six semester hours of college credit in any U.S. institution.

If the international student falls under criteria (1), his or her admission will be based on the work completed in his or her institution abroad only. If the international student falls under criteria (2), he or she is subject to the following requirements:

   a. Meet the requirements for "Nonresidents of Oklahoma-Transfer Admission," elsewhere in this Catalog.

**Engineering Program Admission (International Students).** The international student intending to transfer from a U.S. institution into the engineering program at OSU must meet one of the following requirements:

   1. A student with 24 or more semester credit hours will be eligible for academic admission into the engineering program if he or she has an overall 2.70 GPA on a 4.00 scale, and has a 2.50 overall GPA in engineering related courses from his or her current institution, and has a 2.00 over the immediate past semester before transferring; or

   2. A student with fewer than 24 semester credit hours will be eligible for academic admission into the engineering program only if he or she is both academically admissible by virtue of his or her academic records from abroad and has a 2.70 overall GPA on a 4.00 scale, as well as an overall 2.50 in engineering related courses from his or her current institution in the United States and a 2.00 over the immediate past semester before transferring; or

   3. A student with less than 24 semester credit hours who would not be admissible by virtue of his or her secondary or tertiary academic records from abroad may apply for academic admission after earning at least 24 semester credit hours at another U.S. institution and then meeting the criteria stated for "Nonresidents of Oklahoma-Transfer Admission," elsewhere in this Catalog.

**Transferring From Another U.S. Institution (International Students).** The Immigration and Naturalization Service (INS) must be notified when an international student transfers from one U.S. institution to another. With recent changes in INS regulations, a transferring international student must process the transfer with the institution to which the student is transferring, not with the previous institution. However, if a student is out of status with INS, that student must reinstate him or herself with INS before being allowed to enroll at OSU. Questions regarding a student's immediate immigration status must be directed to the foreign student adviser.

It is entirely the student's responsibility to obtain the correct visa and to maintain the immigration status while in the United States. Refer to the conditions of the visa on the Form 1-20 or on the Form IAP 66 before signing it.

Oklahoma State University has no financial assistance available for international students. INS requires that international students file a statement with the University which shows adequate financial support for their education. OSU has its own financial guarantee form that international students need to complete as a requirement toward admission into OSU.

Students should not plan on financing their education with employment. International students holding F-1 or J-1 visas are seldom permitted to work while they are students in the U.S. After international students have been enrolled for a semester, and if they have acceptable grades, then they are eligible to apply for part-time work at the University.

Even though eligible, many students are unable to find a job on the campus and so do not work. Students holding F-1 or J-1 visas are almost never permitted by INS to work outside of the University campus, and can be deported from the United States if they are found to be in violation of this regulation. It is the responsibility of each international student to understand the INS regulations and to abide by them.
Enrollment and Records

Robin H. Lacy, Registrar and Director of Admissions
Glen K. Jones, Associate Registrar
Darlene Wilson, Administrative Associate
Joan M. Payne, Coordinator, Certification Services
Vera M. Bilyeu, Coordinator, Enrollment Services
Shirlyn Dellig, Coordinator, Student Records
Linda J. Bentley, Coordinator, Publications
Carl E. Jordan, Coordinator, Student Data

Student Enrollment

Enrollment is the process whereby students are counseled by academic advisers regarding course selection and placement, and the subsequent scheduling of those courses. A student must be admitted to the University prior to the enrollment process (see "Entering the University").

First-time Students (Freshmen and Transfer)

An advance fee payment is required prior to participation in the enrollment process. The fall enrollment and orientation period for new freshmen takes place during the summer months. New students receive information about these programs after being admitted to the University. Enrollment and orientation activities include career counseling, academic advising and course selection, and an introduction to campus facilities and services. During the program, students meet with academic advisers who are available to assist in the planning of academic programs and the exploration of interest areas. Parents are encouraged to participate in these programs.

ALPHA Program

ALPHA is a voluntary program designed for all students new to Oklahoma State University. It is a combined effort of many units of the University and the local community to provide a sense of security and well being for new students. ALPHA allows new students to move into their housing units two days ahead of the upperclassmen, to become aware of the services, resources, and people available to them, and to foster peer friendship, development, and support. ALPHA usually begins four days before classes start in August. Specific information is mailed during the summer months to all new students who have applied for admission-freshmen and transfer students.

Continuing Students

Students currently enrolled at OSU may enroll for the subsequent semester during specified periods of the current semester. Prior to the specific enrollment periods, students and academic advisers consult regarding course selections. The "Trial Study" form is then completed and signed by the adviser. Alternate and substitute courses are to be listed on the form where applicable. An overdue account with the University will prevent completion of the enrollment process.

Priority Enrollment. Priority enrollment addresses the needs of students in relation to graduation proximity, with priority based on number of hours earned. Physically handicapped students are extended the option of priority enrollment. Those students currently in an OSU college honors program are extended the option of priority enrollment. Current OSU students who accept University scholarships which require that the student perform a service for the University at a regular time specified by the University, will be given priority enrollment. Working part-time for the University or outside the University does not qualify the student for priority enrollment.

Late Enrollment

A student is permitted to enroll during the first week of a semester or a summer session or on the first day of a summer short course. A student enrolling during the first week of a semester or summer session will pay a late enrollment fee. The late enrollment fee will not be charged on or prior to the first day of a summer short course.

Identification Cards

As part of the enrollment process, each new student is issued a photo identification card. This card, along with the current fee receipt, establishes the student's identity as an OSU student and authorizes access to certain University facilities. Continuing students will have their I.D. cards validated during the enrollment process. Lost or stolen identification cards will be replaced at a nominal fee with proper photo identification from the student.

Change of Schedule

Adding Courses. Approval of the student's adviser is required for adding a course. The first day of the second week of classes of a regular semester or summer session is the last day a course may be added. A short course may be added no later than the first day of the short course.

Dropping Courses. Courses may not be dropped without the approval of the student's academic adviser.

At any time prior to the end of the first week of a regular semester or summer session, or during the proportionate period for block or short courses, a student may drop a course, and no record of the course will appear on the student's academic record.

Before the first week but prior to the end of the sixth week of a regular semester or the third week of a summer session, or proportionate periods for block or short courses, a student may drop a course and receive the grade of "W" (dropped).

After the sixth week of a regular semester or the third week of a summer session but prior to the end of the tenth week of a regular semester or the fifth week of a summer session, a student may drop a course with the grade of "WP" (dropped passing) or "WF" (dropped failing) as assigned by the instructor of each course. The grade of "WF" will be calculated in the grade-point average.

After the beginning of the "Pre-finals Week," a student may not withdraw from the University and shall be assigned only the grade of "A," "B," "C," "D," or "F" or when appropriate) 1/2, "NP," "P," or "R" by the instructor of each course at the end of the semester or summer session. These grades will appear on the student's permanent record.

Vehicle Registration and Parking Regulations

Parking permits for motorcycles, motor-propelled bicycles and scooters may be purchased, and such permit holders will be provided special parking areas.

Bicycle registration may be obtained without charge, an advantage in the event the bicycle is stolen or lost. When bicycles are recovered by the OSU Police Department, they are checked against bicycle serial numbers maintained in the registration files for return to the rightful owners.

(1) A copy of the OSU Parking and Traffic Regulations booklet is available from the Parking Office, 104 USDA Building, located at Orchard Street and Farm Road.)
Faculty and Staff Enrollment in University Courses

The advance fee payment is waived for permanent full-time employees. These employees may audit courses after securing an audit form for a fee of one-half the general fee. Any individual 65 years or older may obtain an audit form at no charge.

Faculty. Permanent (tenure track), full-time (100%) members of the faculty may enroll for credit in one course per semester or a maximum of five hours during normally scheduled working hours and pay one-half the general and activity fees in effect at that time. Exceptions may be permitted only with approvals of the department head, dean and appropriate vice president. If enrollment does not exceed one course, only the department head's approval is needed to receive a fee waiver. If the employee is enrolled in more than one course, the employee's dean and vice president must also give approval for a fee waiver. For more information, refer to the Policy and Procedures Letters.

Administrative/Professional and Classified Staff. Permanent, full-time (100%) active status staff members who meet the academic requirements of the University may enroll for credit and pay one-half the general and activity fees in effect at that time. Enrollment in University courses which meet during the staff member's normal working hours will be limited to one course or a maximum of five hours. There is no limit on the number of courses a staff member may enroll in after normal working hours. If enrollment does not exceed one course, only the department head's approval is needed to receive a fee waiver. If the staff member is enrolled in more than one course, his or her dean and vice president must also give approval for a fee waiver. For more information, refer to the Policy and Procedures Letters.

Early enrollment. Full-time employees of the University who have approval for enrollment may turn in their Trial Study forms to the Office of the Registrar any time after the class schedule book is available. An effort will be made to schedule classes of full-time employees to minimize conflict with their University employment.

Official Records

Freshmen Progress Reports

The faculty will report grades for all freshmen on the dates as printed in the official University calendar. The dates will normally be prior to mid-semester. Progress reports are made available to freshman students shortly afterward. Copies are made available to the students' advisers and the students' deans.

Grade Reports

Reports of the grades of all students are compiled and released shortly after the end of each semester by the Office of the Registrar. These reports are made available to the students, the students' advisers and the students' deans.

Official Transcripts

All official transcripts of students' academic records at OSU are prepared and released by the Office of the Registrar. The official transcript includes the academic record, both undergraduate and graduate. It contains the signature of a University official and the official, imprinted seal of the University. Primary usage of the official transcript is for application for transfer to other academic institutions and for employment purposes. Transcripts of academic records at the University may be ordered in person or by mail from the Office of the Registrar, Transcripts Section, Whitehurst 103, Oklahoma State University, Stillwater, Oklahoma 74078-0102. Official transcripts will not be available until approximately three weeks after final examinations. Requests should include the following:

1. Student's full name (include maiden or other name if applicable).
2. Student I.D. number.
4. The last semester the student attended.
5. Whether the current semester grades are to be included when a transcript is ordered near the end of a semester.
6. Full names of the recipients of the transcripts, whether they are agencies, colleges, or individuals. Complete mailing addresses should also be included.
7. Student's signature. (This is the student's authorization to release the records to the designee.)

A student having delinquent financial obligations to the University will not be granted a transcript.

Copies of transcripts from other institutions cannot be furnished.

Students' Rights to Privacy

The Family Educational Rights and Privacy Act of 1974 (Buckley Amendment) was designed to protect the privacy of educational records, to establish the right of students to inspect and review their educational records in all offices, and to provide guidelines for the correction of inaccurate or misleading data through informal and formal hearings.

An OSU student has the right to:
1. Inspect and review information contained in his or her educational records.
2. Challenge the contents of the educational record.
3. Have a hearing if the outcome of a challenge is unsatisfactory.

4. Submit an explanatory statement for inclusion in the educational record, if the outcome of the hearing is unsatisfactory.
5. Secure a copy of the institutional policy, which includes the location of all educational records.
6. Prevent disclosure, with certain exceptions, of personally identifiable information from the educational record.

Withholding Disclosure of Information. Currently enrolled students may withhold disclosure of directory information. During the first two weeks of the fall semester a student may file with the Office of the Registrar a written request not to release directory information. The University assumes that failure on the part of any student to specifically request the withholding of directory information indicates individual approval for disclosure.

Access to Records. No other information regarding students' educational records may be disclosed to anyone without written consent of students, except to "school officials" who have a "legitimate educational interest" in the student. Students or parents of dependent students may inspect and review their educational records. Some form of photo identification must be displayed before access to educational records will be allowed. Parents of a dependent student may challenge denial of access by producing the most current copy of Internal Revenue Form 1040.

Definitions. "Educational Record" refers to those records which are directly related to a student and are maintained by an educational institution.

"Directory Information" includes: student's name, local and permanent address; telephone number; date and place of birth; major field of study; weight and height of student participating in officially recognized sports; dates and attendance at Oklahoma State University; degrees, honors, and awards granted or received; academic classification such as freshman, sophomore, junior, senior, etc.; sex; class schedule; educational institutions previously attended; degree(s) held, date(s) granted, and institution(s) granting such degree(s); dissertation or thesis title; adviser or thesis adviser; participation in officially recognized organizations, activities, and sports; parents' names and addresses.

"School official" is defined as an individual currently serving as a member of the Oklahoma State University Board of Regents or classified as faculty, administrative, or professional, and the staff such school officials supervise. "Legitimate educational interest" is defined as an interest which results from the duties officially assigned to a school official and which are related to such a school official's responsibility for facilitating the student's development.

Costs

Fees and Tuition

It is extremely important that students carefully consider the total financing of their education, from the entering term to the completion of the degree. If financial help will be needed beyond those funds which the student or the family is able to provide, the student should make the necessary applications for financial assistance well in advance of enrollment. Students should pay particular atten
Students are given information at the time they complete their enrollment on the procedures and deadlines for payment of tuition and fees. (See "Financial Obligations" elsewhere in this Catalog.)

The required fees and nonresident tuition for Oklahoma State University are listed below. General fees and nonresident tuition are based on level of course. All course offerings are listed by four-digit numbers with the first digit indicating level of course. Lower-division courses are all courses with the first digit 0 through 2. Upper-division courses are all courses with the first digit 3 or 4. Graduate-division courses are all courses with the first digit 5 or above.

**Oklahoma Residents**

**Lower-division courses**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fee</td>
<td>$41.30</td>
</tr>
<tr>
<td>Required student activity fee</td>
<td>$2.15</td>
</tr>
<tr>
<td>Required facility fee</td>
<td>$3.60</td>
</tr>
<tr>
<td>Total per credit hour</td>
<td>$47.05</td>
</tr>
<tr>
<td>Required Student Health Center fee per semester*</td>
<td>$36.00</td>
</tr>
</tbody>
</table>

**Upper-division courses**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fee</td>
<td>$44.30</td>
</tr>
<tr>
<td>Required student activity fee</td>
<td>$2.15</td>
</tr>
<tr>
<td>Required facility fee</td>
<td>$3.60</td>
</tr>
<tr>
<td>Total per credit hour</td>
<td>$50.05</td>
</tr>
<tr>
<td>Required Student Health Center fee per semester*</td>
<td>$36.00</td>
</tr>
</tbody>
</table>

**Graduate-division courses**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fee</td>
<td>$58.20</td>
</tr>
<tr>
<td>Required student activity fee</td>
<td>$2.15</td>
</tr>
<tr>
<td>Required facility fee</td>
<td>$3.60</td>
</tr>
<tr>
<td>Total per credit hour</td>
<td>$63.95</td>
</tr>
<tr>
<td>Required Student Health Center fee per semester*</td>
<td>$36.00</td>
</tr>
</tbody>
</table>

**Nonresidents of Oklahoma**

**Lower-division courses**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fee</td>
<td>$138.75</td>
</tr>
<tr>
<td>Required student activity fee</td>
<td>$2.15</td>
</tr>
<tr>
<td>Required facility fee</td>
<td>$3.60</td>
</tr>
<tr>
<td>Nonresident tuition</td>
<td>$91.70</td>
</tr>
<tr>
<td>Total per credit hour</td>
<td>$150.45</td>
</tr>
<tr>
<td>Required Student Health Center fee per semester*</td>
<td>$36.00</td>
</tr>
</tbody>
</table>

**Upper-division courses**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fee</td>
<td>$44.30</td>
</tr>
<tr>
<td>Required student activity fee</td>
<td>$2.15</td>
</tr>
<tr>
<td>Required facility fee</td>
<td>$3.60</td>
</tr>
<tr>
<td>Nonresident tuition</td>
<td>$105.40</td>
</tr>
<tr>
<td>Total per credit hour</td>
<td>$192.85</td>
</tr>
<tr>
<td>Required Student Health Center fee per semester*</td>
<td>$36.00</td>
</tr>
</tbody>
</table>

**College of Veterinary Medicine**

**Oklahoma Residents**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fee</td>
<td>$1,770.00</td>
</tr>
<tr>
<td>Required student activity fee per credit hour</td>
<td>$2.15</td>
</tr>
<tr>
<td>Required facility fee per credit hour</td>
<td>$3.60</td>
</tr>
<tr>
<td>Total per year</td>
<td>$2,130.50</td>
</tr>
<tr>
<td>Required Student Health Center fee per semester*</td>
<td>$36.00</td>
</tr>
</tbody>
</table>

**Nonresidents of Oklahoma**

<table>
<thead>
<tr>
<th>Course Type</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>General fee</td>
<td>$1,770.00</td>
</tr>
<tr>
<td>Required student activity fee per credit hour</td>
<td>$2.15</td>
</tr>
<tr>
<td>Required facility fee per credit hour</td>
<td>$3.60</td>
</tr>
<tr>
<td>Nonresident tuition per semester*</td>
<td>$3,310.00</td>
</tr>
<tr>
<td>Required Student Health Center fee per semester*</td>
<td>$36.00</td>
</tr>
</tbody>
</table>

*Students enrolled in six hours or less pay only $5.00.

**Fees for Facilities and Special Services**

Students regularly enrolled in the University are assessed facility fees which entitle them to use the Student Union, and the Colvin Physical Education Center and the use of the Student Health Center. Certain groups of students in special courses may be on campus for very short time intervals or may be required by the University to reside off-campus for the entire semester. Such students will not use the facilities and will not be charged facility fees when enrolled (a) only in a specialized course(s) offered for a special-interest group and not in any other course(s) in the University or (b) in a course(s) which requires that the student reside off the campus for the entire semester or summer session (medical technology, geology and forestry summer camps). Such courses are offered at unusual times and presented in a concentrated curriculum format.

**Special Class Charges**

In certain courses, special services, supplies or equipment may be used. Costs for these are not normally covered by fees, tuition or departmental operating budgets, and, therefore, the cost is incurred by the student. Special charges are listed in each semester’s class schedule book.

**Special Fees**

**Advanced standing examination fee**

 Locally developed $5.00 per credit hour
 Nationally developed national agency rate Application fee for nonresident students $10.00

**Audit without credit same as Oklahoma residents general fee**

**Automobile parking permit:**

 Campus residents $25.00 per year
 Off-campus residents $35.00 per year

**Correspondence course fees**: 

 High school courses $55.00 per credit (1/2 unit)
 College courses $40.00 per semester hour
 Out-of-state: $75 per SCH (or per 1/2 unit) in addition to the fees listed above.

**Extension course fees**: 

 Undergraduate courses $55.00 per semester hour
 Graduate courses $59.00 per semester hour
 Off-campus at military bases:
 Undergraduate $50.00 per semester hour
 Graduate $62.50 per semester hour
 Out-of-state: $75.00 per SCH in addition to the fees listed above.

**Graduation fees**: 

 Bachelor's degree $10.00
 Master's degree $15.00
 Doctor of Veterinary Medicine degree $12.50
 Specialist in Education, Doctor of Philosophy, Doctor of Education degrees $20.00
 Thesis binding fee $6.00 each
 Dissertation microfilming fee $35.00 each

**International student status maintenance fee**: 

$15.00 per semester
$10.00 per summer session

**Irregular examination fee $1.00**

**Late enrollment fee $5.00 first day, $10.00 maximum**

**Music fees**: 

 Beginning class lessons in music $7.50 per semester hour
 Group lessons in music $15.00 per semester hour
 Individual lessons in music $15.00 per semester hour
 Organ practice $7.50 per semester hour
 Maximum charge per semester for music instruction $60.00

**Transcript (per copy after first one) $1.00**

**Other Expenses**

Books and supplies used by the student are available in the University Bookstore at reasonable prices. Additional incidental and personal expenses such as clothing and entertainment will depend upon the individual student.

**International Students.** It is the long-established practice of Oklahoma State University to charge a special administrative/management/programming fee for international students who need extra
assistance and/or whose sponsors have indicated a requirement or desire for supplementary assistance. This assistance is beyond the content of the regular academic program of the University established for domestic students. The amount of the fees will be based on the level of professional assistance needed. It is the established practice of the University to charge appropriate amounts for such items as special training, research costs, enrichment, necessary travel and transportation, and other costs as may be required to provide a complete and appropriate program of education for international students.

Fee Policy for Faculty and Staff

The advance fee payment, the facility fee and the student health center fee are waived for permanent, full-time faculty and staff. These employees are eligible to enroll in or audit courses and be charged fees at the rate of one-half the amount charged other students under the University fee waiver policy (one-half the general fee, for auditing only, and one-half the activity fee). To be eligible under this fee policy, an employee-student must submit a completed Request for Faculty-Staff Fee Waiver form to the Office of the Registrar prior to the beginning of classes. If the form is not on file prior to the beginning of classes, the student will be granted the waiver in fees. Any individual 65 years or older may obtain an audit form at no charge.

Fee Policy for Graduate Assistants

The University will waive the nonresident tuition for graduate assistants employed at least one-fourth time in instruction, research or extension. Such waiver will include the summer term immediately following employment as a graduate assistant for the spring semester, even though the student is not employed for that summer term.

Refunds

Refunds and deposits that may be due a student will be first applied to encumbrances owed to the University.

Withdrawal and Drop Fee Policy

A student withdrawing from the University or dropping a course prior to completion of the semester or summer session will pay a percentage of the total fees in order to cover administrative and/or instructional expenses. The percentage of fees to be refunded:

Prior to the first week of classes of a semester or summer session:

- 100 percent
- During the first week of classes of a semester or summer session:
  - 100 percent if course dropped
  - 80 percent if withdrawing from the University

During the second week of classes of a semester:

- 80 percent

During the third or fourth week of classes of a semester or the second week of a summer session:

- 50 percent

During the fifth or sixth week of classes of a semester or the third week of a summer session:

- 25 percent

After the sixth week of classes of a semester or the third week of a summer session:

- 0 percent

Fee Refund Policy for Students Entering Military Service

If a student enters military service during the term in which he or she is enrolled and has not completed sufficient work for receiving grades, but is in good standing academically, the University will waive enrollment fees for the student during the term in which he or she re-enrolls after military service has been completed. The amount of the fee waiver is equal to the amount of fees paid for the semester during which withdrawal occurred. If the University finds that it is not feasible to waive the enrollment fees, it will make a refund to the student of the full amount of fees paid.

If a student enters military service during the term and is not in good academic standing at the time, the regular fee refund policy of the University applies.

Residence Hall Rates

All rates are approved by the OSU Board of Regents and are subject to change. The rates listed below are effective for the academic year 1989-90.

### Residence Halls

#### Men's Halls
- East Bennett
- Kerr
- Parker
- Stout
- Wentz
- Willham South
- Iba

#### Women's Halls
- West Bennett
- Drummond
- Scott
- Stout
- Wentz
- Willham North
- Iba

### East and West Bennett Residence Halls

(Rates include a telephone instrument and local phone service in each room.)

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Meal Plan</th>
<th>Semester Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room/5 Meal Plan</td>
<td>$1,001.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/10 Meal Plan</td>
<td>$1,232.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/15 Meal Plan</td>
<td>$1,261.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/20 Meal Plan</td>
<td>$1,292.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/No Food Service</td>
<td>$620.00</td>
<td></td>
</tr>
</tbody>
</table>

### Kerr-Drummond and Scott-Parker Residence Halls

(Air conditioned. Rates include a telephone instrument and local phone service in each room.)

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Meal Plan</th>
<th>Semester Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room/5 Meal Plan</td>
<td>$1,081.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/10 Meal Plan</td>
<td>$1,312.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/15 Meal Plan</td>
<td>$1,341.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/20 Meal Plan</td>
<td>$1,372.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/No Food Service</td>
<td>$700.00</td>
<td></td>
</tr>
</tbody>
</table>

### Stout Residence Hall

(Stout is open only to students who are sophomores and above. Rates include a telephone instrument and local phone service in each room.)

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Meal Plan</th>
<th>Semester Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room/5 Meal Plan</td>
<td>$954.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/10 Meal Plan</td>
<td>$1,185.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/15 Meal Plan</td>
<td>$1,214.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/20 Meal Plan</td>
<td>$1,245.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/No Food Service</td>
<td>$573.00</td>
<td></td>
</tr>
</tbody>
</table>

### Wentz*, Willham North and South Residence Halls

(Air conditioned. Rates include a telephone instrument and local phone service in each room. Cable TV is provided in individual rooms.)

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Meal Plan</th>
<th>Semester Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room/5 Meal Plan</td>
<td>$1,101.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/10 Meal Plan</td>
<td>$1,332.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/15 Meal Plan</td>
<td>$1,361.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/20 Meal Plan</td>
<td>$1,392.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/No Food Service</td>
<td>$720.00</td>
<td></td>
</tr>
</tbody>
</table>

*Wentz is open only to students who are sophomores and above.

### Iba Residence Hall

(Air conditioned. Iba is open only to graduate students and those over 21 years of age. These rates cover charges for the academic year in Iba, from one week prior to the beginning of classes in August through one week after commencement in May, including all break periods. There is an additional charge for the period May through August. Rates include a telephone instrument and local phone service in each room.)

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Meal Plan</th>
<th>Semester Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room/5 Meal Plan</td>
<td>$1,138.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/10 Meal Plan</td>
<td>$1,369.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/15 Meal Plan</td>
<td>$1,398.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/20 Meal Plan</td>
<td>$1,429.00</td>
<td></td>
</tr>
<tr>
<td>Double Room/No Food Service</td>
<td>$757.00</td>
<td></td>
</tr>
</tbody>
</table>

### Bennett Apartments

(Air conditioned. Rates include a telephone instrument and local phone service in each room. Cable TV is provided in additional rooms.)

<table>
<thead>
<tr>
<th>Room Type</th>
<th>Meal Plan</th>
<th>Semester Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/Apartment/5 Meal Plan</td>
<td>$1,203.00</td>
<td></td>
</tr>
<tr>
<td>4/Apartment/10 Meal Plan</td>
<td>$1,434.00</td>
<td></td>
</tr>
<tr>
<td>4/Apartment/15 Meal Plan</td>
<td>$1,463.00</td>
<td></td>
</tr>
<tr>
<td>4/Apartment/20 Meal Plan</td>
<td>$1,494.00</td>
<td></td>
</tr>
<tr>
<td>4/Apartment/No Food Service</td>
<td>$822.00</td>
<td></td>
</tr>
</tbody>
</table>
3/Apartment/5 Meal Plan $1,229.00
3/Apartment/10 Meal Plan $1,460.00
3/Apartment/15 Meal Plan $1,489.00
3/Apartment/20 Meal Plan $1,520.00
3/Apartment/No Food Service $848.00
2/Apartment/5 Meal Plan $1,653.00
2/Apartment/10 Meal Plan $1,884.00
2/Apartment/15 Meal Plan $1,913.00
2/Apartment/20 Meal Plan $1,944.00
2/Apartment/No Food Service $1,272.00

**University Apartments**

(Rates include a telephone instrument and local phone service in each apartment. There is an additional $6.25 per month charge for cable service.)

The University operates apartments designed to house married, single parent, and a limited number of single graduate and upperclass students.

### Monthly Charge

- **Graduate Apartments (central AC):**
  - Unfurnished $363.00
  - Furnished $378.00

- **Brunley Apartments (window AC):**
  - Unfurnished $304.00
  - Furnished $319.00

- **Dwellings Similar to Graduate Apartments:**
  - Unfurnished $292.00
  - Furnished $307.00

(Air conditioning can be provided by the University for an additional monthly charge during the months the air conditioner is in use.)

- **Single-story and two-story dwellings:**
  - Unfurnished $292.00
  - Furnished $307.00

(Basic differences are the age of the apartments, color scheme, lighting and furniture. Air conditioning can be provided by the University for an additional monthly charge during the months the air conditioner is in use.)

### Estimated Total Expenses for Students

An estimated budget (based on 1989-90 figures) for an undergraduate student at OSU is as follows:

- **Resident**
  - Tuition and Fees $715.00 (Based on 14 credit hours)
  - University Housing 1,327.00
  - (Based on average, double occupancy, residence hall charges)
  - Textbooks and Supplies 203.00
  - Ave. Misc. Personal Expenses 1,063.00
  - Total Per Semester $3,308.00

- **Nonresident**
  - Tuition and Fees $2,094.00 (Based on 14 credit hours)
  - University Housing 1,327.00
  - (Based on average, double occupancy, residence hall charges)
  - Textbooks and Supplies 203.00
  - Ave. Misc. Personal Expenses 1,063.00
  - Total Per Semester $4,687.00

### Financial Aid

**Charles W. Bruce, Director**

**Patrick Kennedy, Assistant Director, Administrative Services**

**Gary Garoffolo, Assistant Director, Programs**

**Linda K. Good, Coordinator, College Work Study Programs**

**B.B. Butler, Coordinator, Records**

**Cheryl Gebhart, Coordinator, Reports**

**Bonnie Joerschke, Senior Counselor**

**Gary Davidson, Counselor**

**Judith Finnegan, Counselor**

**Cathy Gose, Counselor**

**Kathy Greenlee, Counselor**

**Diane Van Fleet, Interim Manager, Financial Aid Data Systems**

Students who need financial assistance to attend college are encouraged to consider the many types of financial aid available through the OSU Office of Student Financial Aid. These programs include scholarships, grants, loans, and part-time jobs. Financial aid at OSU is awarded on the basis of demonstrated financial need. Each student who wishes to be considered for need-based assistance should complete the American College Testing Service Family Financial Statement (ACT-FFS) and submit it to the processing center in Iowa City, Iowa as soon as possible to receive financial aid. Students who do not demonstrate financial need are awarded solely on the basis of academic achievement, for which standardized test scores and high school and college grade-point averages are used as awarding criteria.

There are also programs available for students who do not demonstrate financial need. A number of fee waiver scholarships are awarded solely on the basis of academic achievement, for which standardized test scores and high school and college grade-point averages are used as awarding criteria.

**Oklahoma State University 15**

**University Housing**

(Available fees include basic differences are the age of the apartments, color scheme, lighting and furniture. Air conditioning can be provided by the University for an additional monthly charge during the months the air conditioner is in use.)

(Continued...)

**Financial Obligation**

Enrollment at Oklahoma State University incurs certain obligations and commitments on the part of an individual student, one of which is the student's responsibility to pay all financial accounts owed to the University in a timely manner. In order to remain in good financial standing with the University and thereby continue to participate in its educational programs, services and benefits, a student must meet all financial obligations incurred at the University on or before the due dates described.

All students are required to pay an advance fee payment toward their estimated fees at the time of enrollment. This advance payment will be credited to the student's account and applied to outstanding charges during the last semester of attendance. A student may request a refund of the advance payment at any time in which it is not required to hold an enrollment and there are no outstanding charges against the account.

Tuition and fees will appear on the regular monthly statement which is mailed to the student's local address.

All fees (required and optional) and tuition associated with the student's enrollment shall be due in the Office of the Bursar no later than 5:00 p.m. on the 15th day of each month following billing. All delinquent accounts in excess of $40 will accrue an interest penalty at the rate of one and one-half percent monthly.

Accounts must be cleared before the student can obtain the release of any records, secure a transcript, receive a diploma, or enroll at Oklahoma State University for subsequent semesters.

To be considered for financial aid, a student must:

1. Be a U.S. citizen or a permanent resident of the United States. Those who are not citizens or permanent residents are not eligible for federal or state assistance.
2. Be enrolled at least half-time as a degree or certificate-seeking candidate. Half-time status is defined as taking at least six credit hours as an undergraduate or four credit hours as a graduate student.
3. Not be in default on a Stafford, PLUS/SL, or Perkins Loan.
4. Not owe a repayment to the Pell Grant, SEOG, or OTAG program.
5. Meet minimum satisfactory academic progress standards.

Students and parents are invited to contact the Office of Student Financial Aid for information regarding financial aid programs or to make an appointment with a financial aid counselor to discuss specific eligibility requirements.
Student Loans

OSU has several loan funds for students who need financial assistance. These funds are available to students who meet the eligibility requirements of the various programs and are making satisfactory progress in their college work.

Institutional loans include short- and long-term loans. The Funds Advance program provides up to a maximum of $200 per semester (less a $4.00 service charge) for the purpose of meeting educationally-related expenses which are not charged to a student's University account. Students are billed for the Funds Advance through the Office of the Bursar on the billing statement of the month in which they apply. Applications, however, must be made in person at the Office of Student Financial Aid.

Long-term loan programs consist of the Perkins Loan, Stafford Loan, and Parent Loan and Supplemental Loan programs. The rate of interest on a Perkins Loan during the period of repayment is five percent simple interest per annum on the unpaid balance. The rate of interest on the Stafford Loan is eight percent for first-time borrowers. The rate of interest on a Parent Loan or Supplemental Loan is variable but cannot exceed 12%. Both loans require additional applications which are available at lending institutions or the OSU Office of Student Financial Aid.

Scholarships

Approximately 1,900 undergraduates and graduate students receive fee waiver scholarships each year. Approximately 100 students receive Wentz Service Scholarships and numerous other scholarships are awarded through the various departments and colleges at OSU.

Fee Waiver Scholarships

Fee waivers are awarded to undergraduate and graduate students on the basis of both demonstrated financial need and academic achievement. Awards range from approximately $550 to $850 per year. Freshman fee waivers are awarded to entering students who have attained a high scholastic standing in high school. Further information may be obtained from the Office of High School and College Relations.

Upperclass University scholarships are awarded each year to sophomores, juniors, and seniors who have outstanding academic records. Applications for these scholarships can be obtained from the Office of Financial Aid and must be received by March 1.

Transfer scholarships are offered each year to students transferring from junior colleges to OSU. Applicants must apply for admission by March 1.

Graduate students should contact their department heads regarding application procedures and scholarship deadlines.

Wentz Service Scholarships

This program provides undergraduate students with work settings in which they can develop skills to benefit them in their future employment. Application is made directly to any of the respective colleges or participating administrative offices at OSU. Service scholarship recipients earn $4.25 per hour or up to $1,500 per year. Recipients will be notified about their awards and work assignments by either the colleges or administrative offices through which they receive their scholarships.

Other OSU Scholarships

Both undergraduate and graduate students are encouraged to explore other scholarship opportunities that may be offered by the various colleges and academic departments at OSU. The student academic services office of each college is an excellent resource for specific scholarship information. The student may wish to use the scholarship search program, FINDS, to assist in locating other scholarship sources. FINDS is located in the Office of Student Financial Aid.

Grants

Undergraduate students who have not completed their first undergraduate degree are eligible to apply for two federal grant programs, the Pell Grant and Supplemental Education Opportunity Grant. Undergraduate and graduate students who are Oklahoma residents are eligible to apply for the state grant program, the Oklahoma Tuition Aid Grant.

Pell Grant eligibility is determined by the U.S. Department of Education by using a congressionally-approved formula. Each applicant will receive a Student Aid Report (SAR) from the Pell Grant processor. Eligible students should submit all copies of their SAR's to the Office of Student Financial Aid.

Supplemental Education Opportunity Grants are awarded to students who demonstrate financial need as reflected in the needs analysis form. Funding in this program is limited and is usually awarded to applicants who demonstrate the most financial need.

Oklahoma Tuition Aid Grants are awarded to eligible Oklahoma residents who may apply by completing the appropriate sections of the ACT-FFS. Grant amounts are determined by the applicant's academic classification, enrollment status, demonstrated need, and by the availability of funds. Students are notified of their eligibility and award amounts by the Oklahoma State Regents for Higher Education, not by OSU.

College Work-Study

This program is designed to help students meet their education expenses through part-time employment. The Office of Student Financial Aid determines award amounts on the basis of financial need. While all College Work Study student employees are paid at least the current federal minimum wage, the actual rate of pay depends on their qualifications and the types of jobs that they hold. Eligible students may be employed by any office or department at OSU or at an off-campus, non-profit agency. By attempting to place students in areas in which they are interested, the College Work-Study Program helps to stimulate the development of worthwhile work experience for the student while attending college.

Student Employment

The Office of University Personnel Services, Employment section, provides assistance to OSU students seeking part-time employment. Students are informed of job opportunities both on campus and in the Stillwater community. Students interested in employment may obtain applications in this office. After completing the application, the student should return it to the office and make arrangements to visit with an employment interviewer. The largest number of jobs are available at the beginning of each semester; however, jobs do become available throughout the year.

Jobs on campus usually offer 12 to 20 hours of work per week in clerical, technical, food service, or general labor positions. Rate of pay and work schedules vary. Ideally, students seeking on-campus work should schedule their classes to allow for a block of four hours free time during the morning or afternoon, Monday through Friday. More flexible working hours may be possible in similar positions in the Stillwater community.

Part-time job opportunities are posted on the bulletin board outside the office at 407 Whitehurst.

Student Services

Residential Life

Robert Huss, Director of Residential Life
Eddie Denman, Assistant Director of Residential Life-Business and Administrative Services
Dane Blubaugh, Assistant Director of Residential Life-Construction and Renovation
Kent Sampson, Assistant Director of Residential Life-Residence Halls East
Tim Luckadoo, Assistant Director of Residential Life-Residence Halls West

The Office of Residential Life exists to aid its residents. Students who live on campus are more likely to graduate in four years and maintain higher grades than those living at home or in off-campus apartments. The Office of Residential Life provides residence hall space for approximately 5,000 students, apartments for more than 700 students, and a food service program, available to all students and staff, that is nutritious, convenient and enjoyable. All freshmen live in residence halls unless exempt for one of the following reasons: being married; living with parents in Stillwater or the surrounding area; being a veteran; living in a fraternity or sorority house (sorority pledges generally live in residence halls due to limited sorority house space); having a demonstrated financial or medical hardship; or having completed 27 credit hours.

All inquiries should be addressed to the appropriate office, depending on the student’s housing needs. All accommodations are rented on a contract date priority basis. Applications and contracts are encouraged to be sent in early in order to receive the preferred on-campus housing location.

Residence Halls

OSU Residence Halls offer a variety of living accommodations: apartments in Bennett, traditional non-air-conditioned space in Bennett and Stout, and contemporary air-conditioned space in Scott-Parker-Wentz, Kerr-Drummond, and Willham North and South. Iba Residence Hall provides year-round housing for graduate and undergraduates who are 21 years of age or older. Stout and Wentz halls are available for students' summer housing.

The Office of Residential Life emphasizes the development of interpersonal skills by having the staff teach leadership skills, group development skills, personal interaction skills, and study skills in non-credit seminars and credit classes. These programs are the formal aspect of helping students to become involved in the residence halls. Resi-
dence halls and dining centers offer numerous opportunities for student leadership. More than 1,000 students are involved in planning and leading educational, recreational and social activities within the residence halls.

Residence hall living is relatively inexpensive. Over $1,400 per year is saved by the average student living in residence halls versus living off campus. Residence hall rates include all utilities including telephone (cable TV in some halls.) The 20-meal plan usually costs less than $2.00 per meal. The in-hall laundry facilities are convenient and economical as is the on-campus parking.

Residence hall rates do not increase during the academic year.

Students are offered several lifestyle options from which to choose, such as floors and houses for fine arts; foreign languages; honors (ACT of 25 and above); intensive study; and engineering.

In every residence hall there is a well-trained professional staff to coordinate the day-to-day operations of the building, as well as the student staff whose primary function is to see that students benefit educationally from their residence hall living experience. Each floor or wing has a live-in student staff member (resident assistant) responsible for advising and guiding the residents. Resident assistants are undergraduate students specially trained in all aspects of residence hall living with the experience and knowledge to answer questions and act as an adviser for student government and programs.

Students who live on campus enjoy the opportunity to participate in the on-campus meal plan. Students may choose from five to 20 meals per week. (Freshmen are required to take at least 10 meals per week) depending on their individual needs. Some students choose not to be on the meal plan. A variety of offerings are available in the four dining centers (Bennett, Kerr-Drummond, Scott-Parker-Wentz, and William cafeterias). Any student may eat any meal in any of the four dining centers. Each dining center offers a unique menu as well as the standard cafeteria selection. Specialty menus inlude delicatessen, health club, pasta and weight watchers. These specialty plans vary as the students’ needs change.

For more information, contact the Office of Residential Life, Oklahoma State University, Iba Hall, Stillwater, Oklahoma 74078.

Disabled Student Housing

All residence halls offer some housing for students who have impaired mobility. Upon notification, the Office of Residential Life routinely modifies rooms to meet an individual’s special needs. Six single-student rooms on the first floor of Drummond Hall have been permanently modified for students with physical disabilities. Alterations to this area include special bathroom and laundry facilities, bedlifts, special Elevator, automatic entrance and exit doors, and beds and desks that meet federal standards.

University Apartments

More than 700 all-brick apartments are available within walking distance of the campus. These apartments serve students in the following priority: families, single graduate student, and single undergraduate students. All apartments are two-bedroom units that are available fully or partially furnished, or unfurnished.

The apartments have attractive outdoor surroundings with sidewalks, off-street parking, play areas, and laundry facilities provided in the University laundry and in the Brumley area.

School bus transportation is provided to the Stillwater Middle School and High School, and one of the elementary schools. All other schools are within one and one-half miles of the housing area.

The Family Resource Center located in the University Apartments area offers a variety of programs to meet the needs of University Apartment residents. These programs vary depending upon the needs of the clientele as determined by surveys and individual meetings with residents. Typical programs have included: car seat loans, toy library, adolescent sexuality, child care information, and Thanksgiving dinners.

For more information contact the University Apartments Office, E-2 Brumley, Oklahoma State University, Stillwater, Oklahoma 74078.

Student Health Services

Donald L. Cooper, M.D., Director Alice F. Gambill, M.D., Assistant Director O. Joseph Hake, M.D., Staff Physician

Thomas L. Hansen, M.D., Staff Physician

Ngheem X. Huc, M.D., Staff Physician

Mary Sue Pinski, M.D., Staff Physician

Ronald R. Sanders, M.D., Staff Physician

Sherry Maxwell, Director Mental Health Clinic

A student enrolling at Oklahoma State University for the first time is required to present a record of a physical examination by his or her private physician, or present a recent equivalent record of physical examination, such as a record from a place of employment or school, or the Armed Forces. An immunization record is of utmost importance. This health report is for determination and evaluation of the condition of the student so that corrective measures may be taken.

Oklahoma State University is as interested in the student’s physical and emotional well-being as it is in his or her intellectual and cultural development. Good health will not guarantee academic success but it will help; while poor health, either physical or emotional, can impair both the academic and the extra-curricular career.

The OSU Student Health Center maintains a staff of seven full-time physicians, three staff psychologists, 20 registered nurses, three laboratory and x-ray technicians, and other necessary supportive and ancillary personnel who make a specialty of providing the best possible care at the least possible expense for the student. Along with this full-time help, there are part-time specialists in internal medicine, psychiatry, dietetics and radiology. Specialists in all other fields are available for individual and group cases.

Most injuries and illnesses can be treated at the Student Health Center, except major surgical cases, which can be diagnosed and then referred to either the family physician if time permits, or to a local surgeon in Stillwater. No dental care is offered.

There are no charges for office visits to see the physicians. This service is covered by the designated health fee paid by the student. To cover direct costs on laboratory, x-ray, pharmacy and hospital services a moderate fee is charged. There are 18 beds available for hospitalization and isolation if needed. A licensed nurse is on duty in the hospital and a physician is on call 24 hours a day for care of patients.

Counseling Services

Patrick M. Murphy, Director

Martha Jordan, Assistant Director

The University Counseling Services provides free and confidential professional counseling assistance to students. Students experiencing a variety of concerns may find this service helpful to them.

Assistance can be provided with emotional problems, as they affect personal and academic goals, intellectual functioning or relationships with others. Services include a broad range of developmental, remedial and preventive activities.

Help is available with the selection of an academic major, when such selections are more complicated or difficult than usual.

The Counseling Services also assist students with problems, concerns, and experiences relating to educational difficulties; i.e. study habits, unusual test-taking stress, lack of motivation, or attitudes related to school.

Most services are provided at no charge. Minimal fees are assessed for certain tests and for specific programs or workshops. Depending upon the need, tests and other University services may be used in conjunction with counseling.

All information regarding appointments and content of meetings is confidential.

The University Counseling Services is an accredited member of the International Association of Counseling Services, Inc.

Personal Counseling Services

Pamela A. Miller, Coordinator

Personal counseling is offered in either an individual or group setting. Discussions between counselor and student in personal counseling can center on any situation which keeps the client from fully realizing his or her personal or academic
potential. Among the variety of concerns dealt with in personal counseling are stress, anxiety, depression, eating disorders, substance use/abuse and interpersonal relationships.

Additional services provided to the academic community are developmental programs and workshops and consultation services.

**Career Counseling Services**

Counselors are available to assist students in personal assessment of career interests, values, and abilities to identify possible career directions related to a major area of study. Several services are provided for career decision making: individual counseling, DISCOVER Center, Career Interest Testing, and Career Outreach Programs.

**Disabled Student Services**

1. Disabled Student Services provides assistance for prospective and current students with physical disabilities. Information and assistance with the University Attendant Care Program, Van Service, tutors, and other programs can be obtained from the Office of Disabled Student Services.

**Minority Programs and Services**

Howard Shipp, Coordinator
Teresa Newson, Black Student Counselor
Patricia Brooks, Hispanic Student Counselor
Pete G. Coser, Native American Student Counselor

Minority Programs and Services (MPS) is a comprehensive support service for Black, Hispanic, Native American and Vietnamese-American students. The program provides educational and personal growth opportunities to enhance the university experience for minority students matriculating at Oklahoma State University. Support services are provided through one-to-one counseling, group counseling, outreach programs, academic skill development programs, and tutoring. The following areas of student development are emphasized: academic development, personal adjustment/development, motivation, and career goals.

Minority Programs and Services staff work closely with other offices of the University. These efforts include direct and indirect assistance in the following areas: recruitment and retention; financial assistance; career development and employment opportunities; and a network of accurate information.

To enhance the social and cultural opportunities for minority students, MPS staff members serve as a resource to various minority student groups and organizations in an advisory or consultative capacity. These organizations include: Hispanic Student Association, Afro-American Student Association, Minority Women's Association, Native American Student Association, Vietnamese-American Student Association, American Indian Science and Engineering Society, Burnin' Black Choir, NAACP, Society of Black Engineers, Technicians and Architects, and the Black Greek organizations.

**International Student Services**

Elaine Burgess, Coordinator
Stephen Haseley, Counselor
Mary Ann Kelly, Counselor
Regina Henry, Program Specialist

The International Student Services office (ISS) provides assistance to more than 1,500 international students from countries as far away as Singapore and Zambia and as close as Canada and Mexico. The goals of the office are to assist international students to: learn about their new surroundings; use the resources of the University and community; provide academic services; and advocate for students throughout the University and the community.

The staff in the International Student Services office is responsible for advice to students and faculty on matters which are unique to international students and scholars. Personal counseling, individual planning, liaison with embassies and consulates, legal referrals, academic referrals, immigration matters, orientation programs, and advising to groups are among the services offered. Non-immigrant students can apply for on-campus work permits in the office.

Pre-arrival information is sent to students from the office. Orientation and assistance with housing, banking, enrollment, etc., are offered to newly-arrived students. A one-hour credit course, "American Studies Survey," (UNIV 1011) taught by many OSU professors, is coordinated by ISS. In collaboration with other OSU departments and community groups, a variety of cross-cultural programs is presented throughout the year. Interested American student volunteers participate and assist with a variety of activities.

The International Student Services office encourages international and American students, faculty, staff and community members to use its services and participate in the programs.

**Special Programs, Services and Facilities**

**The Honors Program**

Oklahoma State University's college-centered Honors Program provides special opportunities for outstanding students through special honors courses, honors sections of many general education courses, and honors contracts. The Honors Program utilizes the extensive resources of a comprehensive university in a setting which provides personal attention and a supportive academic environment through small classes, independent study and faculty-guided research opportunities.

Honors awards include the general education honors certificate, departmental honors, and the bachelor's degree with honors. The student's official transcript reflects these awards, and a special honors diploma is awarded for the bachelor's degree with honors.

In addition to the academic opportunities available in the classroom, Honors Program students receive priority enrollment status, extended library privileges, and the opportunity to utilize the recently completed Honors Lounge in the Edmon Low Library.

For details about the Honors Program in each of the academic colleges, interested students should consult the director of student academic services of their college or, in the College of Arts and Sciences, the director of the Honors Program.

**Bachelor of University Studies**

Individualization and flexibility are the features of the program leading to the degree of Bachelor of University Studies. This program is designed for the goal-directed, motivated and mature student who finds that the present degree programs (majors) at the University will not enable the student to attain his or her educational objectives; it is not intended for students whose educational objectives are undetermined. The Bachelor of University Studies degree permits a student to utilize the total resources of the University available in accomplishing unique educational objectives. The program may or may not prepare a student for a particular occupation or entry into a professional school.

Students interested in the Bachelor of University Studies Extended Studies Option (BUS-ESO) should visit with the dean or designated administrative officer of the college. Available in some colleges, this option is designed especially to meet...
the needs of the adult learner who has amassed either a number of credits from a variety of institutions of higher education or life-experience learning which can be documented and substituted for credits via a portfolio or other form of examination. A student who believes that his or her educational objectives can best be fulfilled through a Bachelor of University Studies degree program can obtain information on the program from the office of student academic services in the college in which the student is to be enrolled.

All students who intend to present a program for the Bachelor of University Studies degree must enroll in one of the colleges of the University. The Bachelor of University Studies degree program must meet requirements stated in the "University Academic Regulations" in this Catalog.

Pre-law, Premedicine and Other Preprofessional Programs

Students planning to enter a professional school should visit with their advisers and consult professional school admission and course work requirements listed in the specific school catalog. It is the practice of many professional schools to select students with a variety of bachelor's degrees, although others may require a minimum basic core curriculum of varying length and grade-point average. Preprofessional program information is available in such areas as law, medicine, dental hygiene, dentistry, engineering, library science, medical technology, nursing, occupational therapy, optometry, osteopathy, pharmacy, physical therapy, physician's associate, radiologic technology, social work, and veterinary medicine. For more information, students should consult their advisers or the director of student academic services of the appropriate college.

University Center at Tulsa

The University Center at Tulsa (UCT) was established in 1982 to provide the third and fourth years of undergraduate study and master's degree programs for the Tulsa metropolitan area. Programs of study are offered by each of four institutions-Langston, Northeastern, Oklahoma State University, and the University of Oklahoma. The Oklahoma State Regents for Higher Education exercise governmental control of the University Center at Tulsa in allocating and administering state-appropriated funds. Oklahoma State University is approved to offer courses leading to twenty-six degree programs, three of which are undergraduate and the remaining are graduate programs. The four cooperating institutions are not permitted to duplicate programs. Courses taken through the University Center at Tulsa are treated as residence credit at the institution teaching the course. To ensure programs at UCT are comparable to those on the Stillwater campus, Oklahoma State University assigns UCT classes as part of the regular teaching load of OSU faculty when possible.

Courses taken through the University Center at Tulsa taught by Langston, Northeastern, or the University of Oklahoma are accepted at Oklahoma State University as transfer credits. For information on transfer of credits, refer to the section "Transfer of Credits" elsewhere in this Catalog. Admission requirements for students seeking admission to programs offered by Oklahoma State University through the University Center at Tulsa are the same as if they were enrolling in classes at the Stillwater campus.

Degrees are granted by each of the cooperating institutions, not by the University Center at Tulsa. Graduates participate in the home institutions' commencement programs.

Advanced Standing Program

Oklahoma State University Testing and Evaluation Service is a national test site for the College Board's College Level Examination Program (CLEP). National CLEP testing centers offer two kinds of examinations: general examinations and subject examinations. OSU only grants college credit for the subject examinations. Credit earned through these examinations are normally recognized by other colleges and universities throughout the nation.

Oklahoma State University is a national test site for ACT's Proficiency Examination Program (PEP). The University Testing and Evaluation Service administers PEP examinations in nursing, business, and the arts and sciences.

OSU grants credit for acceptable scores in the Advanced Placement Program (AP) as administered by the College Entrance Examination Board in Princeton, New Jersey. The AP tests are taken by high school students while in high school. High school counselors can be of assistance in making testing arrangements.

Oklahoma State University recognizes credit earned through the International Baccalaureate Program which is administered through some high schools.

Military personnel and veterans who wish to establish credit for military training should submit to the Office of the Registrar and Admissions a copy of their DD214, Armed Forces of the United States Report of Transfer of Discharge, or their DD295. Application for the Evaluation of Educational Experiences During Military Service. OSU also accepts credits earned throughout the DANTES Subject Standardized tests for active military personnel.

Academic departments on campus at OSU may offer advanced standing examinations in subject areas not offered by the CLEP, PEP or AP. Any currently enrolled student whose travel, employment, extensive readings or educational experience appear to have given the student proficiency in a subject that is offered at OSU, equivalent to the proficiency ordinarily expected of those students who take the subject in a regular class, may apply for an examination on the subject. A student who has earned credit in a course which OSU refused to accept, because the institution at which the course was taken was not accredited, may apply for a validation examination. The dean of the college in which the course is offered appoints a committee of three to construct, administer and evaluate the examination.

Information pertaining to these examinations may be obtained from the Office of the Registrar and Admissions.

Scholar-Leadership Enrichment Program

The Scholar-Leadership Enrichment Program (SLEP) is a statewide academic program designed to develop scholarship and leadership abilities of outstanding students. Students study in intensive, five-day seminars with a distinguished scholar and are selected from Oklahoma's 21 four-year colleges and universities. OSU's upper-division and graduate students with a 3.00 GPA are eligible to apply. Freshmen and sophomores who have demonstrated exceptional academic achievement are also considered. SLEP seminars carry two hours of credit, and the only cost to students is the tuition for two credit hours and a transcript fee.

The seminars are graded on a satisfactory/unsatisfactory basis and is transferred to OSU as Pass/Fail. Application should be made as early as possible in the academic year as possible. Further information and application materials may be obtained from OSU's SLEP Coordinator, College of Arts and Sciences Dean's Office.

Semester at Sea

Semester at Sea is an opportunity for OSU undergraduates in good academic standing to earn a semester of credit in a wide range of academic areas while traveling around the world on the S.S. Universe. Approximately 50 percent of the semester is spent at sea and 50 percent in various ports allowing students to travel and relate experiences directly to the academic program aboard ship. Specific information may be obtained by contacting the Office of International Programs.

Study Abroad

Students at OSU are encouraged to broaden and add an international aspect to their education by taking part in study abroad programs. Students may earn credit while participating in programs in many parts of the world, including China, France, Germany, Japan, Mexico, Spain and the Soviet Union.

Students may earn OSU credit for summer work and residence in Belgium, France, Germany and Switzerland, through the International Cooperative Education Program.

Outstanding undergraduate and graduate students may qualify for the Bailey Trust Memorial Scholarship for study abroad in the liberal arts.

Students interested in study or work abroad and in scholarship opportunities should inquire at the Center for Global Studies, Life Science East 322, or at the Department of Foreign Languages and Literatures.

MASUA Traveling Scholar Program

The Mid-America State University Association (MASUA) Traveling Scholar Program is designed to provide breadth and depth in the opportunity for graduate study offered at MASUA universities by permitting advanced graduate students to
Special Services

Academic Advising
Academic advising is considered a major function within the University and is student-centered in that it serves the student first and foremost and not a particular discipline, department or college. Academic advising is designed to assist students in developing their intellectual potential through effective use of all resources available at the University-academic, cultural and social. Thus the role of the student's academic adviser is (1) to assist in educational planning, including clarification of career and educational goals, curriculum planning, and short-term course selection, (2) to become aware of and make appropriate referrals to campus support services, (3) to provide information to prospective majors, and (4) to prepare degree plans for graduating seniors and submit these to the respective college graduation certification office.

The advising function is performed within each of the undergraduate colleges and in the Office of Freshman Programs and Services. Each college structures its advising system based upon the college's philosophy and perceived student needs. In most colleges, freshmen and undeclared students are advised through the college's office of student academic services, while students who have declared majors are advised by an adviser in the college's office of student academic services to represent him or her in their major department.

Each academic dean has established an office of student academic services to represent him or her in matters concerning undergraduate students. Students are encouraged to contact their office of student academic services when questions arise regarding advising, academic programs and requirements, and academic support services. The locations of the offices of student academic services are:

- Agriculture-136 Agricultural Hall
- Arts and Sciences-202 Life Science East
- Business-201 L Business Building
- Education-102 Gundersen
- Engineering, Architecture and Technology-101 Engineering North
- Home Economics-113 Home Economics West
- Freshman Programs and Services-201 Whitehurst Hall

Students should keep in mind that while the University provides advising as a service and resource, the ultimate responsibility for identifying and completing degree requirements rests with the student.

Freshman Programs and Services
The Office of Freshman Programs and Services (FPS) is responsible for providing academic advisement and other related academic services to entering freshmen who do not wish to declare a major or college during their first semester and to students who are admitted on probation. Students who enroll through FPS are assigned to advisers who assist with the exploration of career goals, and decision making regarding appropriate degree programs, as well as with the clarification of University policies. The primary goal of FPS is to provide personal attention and assistance to students as they explore the various academic options available to them at OSU. Advisement in Freshman Programs and Services is also directed toward assisting students in meeting the University's General Education requirements required of all students pursuing a baccalaureate degree. FPS advisers are knowledgeable in the degree programs in all of the six undergraduate academic colleges and maintain liaison relationships with the student academic services offices on campus.

University Academic Assessment Program
The office also provides academic advising and counseling to students enrolled in the University Academic Assessment Program (UAAP), This program is designed for students who have been suspended due to academic difficulty, yet recommended by their academic college to UAAP for reinstatement on a probationary basis. Reinstatement in UAAP gives students another opportunity to re-evaluate their career and educational goals in an attempt to develop a realistic and successful educational plan. In addition to meeting minimum grade-point averages required by UAAP, students must enroll in and satisfactorily complete the course "Academic Assessment and Exploration." This course is designed to help students identify their reasons for experiencing academic difficulty and determine ways to overcome their academic weaknesses. It also assists students in exploring various career and educational alternatives.

In addition to the teaching, academic advising and counseling functions of FPS, the office serves as a central informational center through which referral to a variety of campus academic and non-academic support services may be obtained.

Tutor Referral Service
The Tutor Referral Service is a resource which refers OSU students to qualified tutors, free departmental tutoring programs, and other academic support and resource centers. This information is offered on a campus-wide basis and is made available to students through the Office of Freshman Programs and Services.

Computer Center
The University Computer Center is one of three departments in the University Computing and Information Systems unit. The purpose of the Computer Center is to provide computing services to support the instruction, research and administrative functions of the University. The Center also provides technical assistance and training to the University community in the use of the Computer Center facilities.

The main Computer Center facilities are located in the basement and the first floor of the Math Science building. In addition, the Computer Center has four remote facilities for general use, consisting of computer terminals and printers located in Agricultural Hall 241, Business 009, Engineering South 113, and Parker Hall basement.

The Computer Center provides approximately 110 terminals and 14 printers for general use in Agricultural Hall 241, Business 009, Engineering South 113, Iba Hall, Math Science basement, Parker Hall basement, and Stout Hall 047. The terminal rooms are open the same hours as the buildings.

Mathematics Learning Resource Center
The Mathematics Learning Resource Center (MLRC) is intended to be the hub of undergraduate mathematics instruction at OSU. The MLRC is located in the basement of South Murray Hall and is open to students on a walk-in basis. The MLRC consists of a 52-station networked microcomputer lab, a twenty-station video lab, and a tutoring room. Instructional software and several programming languages are available, as well as a library of video cassettes which contain lessons on almost all mathematics courses from calculus and below. There are also five Caramate audiovisual units for studying audio tapes and slide presentations.

Graduate and undergraduate students major-
ing in mathematics are assigned to the Center to tutor students and to assist students in the use of the equipment.

**Psychological Services Center**

The Psychological Services Center in North Murray Hall was established in 1971 as a training, service, and research facility for Oklahoma State University, Stillwater, and the surrounding community. It is operated by the Department of Psychology through the College of Arts and Sciences.

Services are provided to children, adolescents, and adults. The Center's clients include residents of Stillwater and the surrounding community as well as OSU students, faculty, and staff. The Center offers a variety of psychological services such as: emergency and crisis intervention; individual, group, family, and marital therapy; parental counseling and training; play therapy for children; treatment of phobias and anxiety disorders; biofeedback; relaxation training; assertiveness training; hypnosis; stress management; intellectual, personality, neuropsychological assessment; and school consultation.

The Center's staff includes master's, doctoral, and postdoctoral students in the clinical psychology training program, which is accredited by the American Psychological Association. The staff also includes supervising clinical and developmental psychologists from the Department of Psychology faculty who are licensed by the Oklahoma State Board of Examiners of Psychologists. Although the exact composition of the staff may change from year to year, the staff is generally composed of individuals from diverse ethnic and cultural backgrounds.

There is a graduated fee ranging from $2.50 to $35.00 per hour session, depending on one's financial situation, although no one is turned away because of an inability to pay. Partial coverage is generally available for OSU faculty and staff covered by the OSU group insurance policy. The Center is open from 8:00 a.m. until 10:00 p.m. Monday and Tuesday and from 8:00 a.m. until 5:00 p.m. Wednesday, Thursday and Friday. Appointments for confidential assistance can be made by contacting the Center, or on a "walk-in" basis.

**University Placement**

University Placement assists OSU students and alumni in the colleges of Arts and Sciences, Business Administration, Education, and Home Economics with career planning, development, and professional employment after graduation. Placement services for students and alumni in the colleges of Agriculture and Engineering, Architecture, and Technology are coordinated by their respective student academic services offices. Services to students by University Placement include: campus interviewing, providing job vacancy lists, referring graduates to employers, assisting in resume preparation, sending placement credentials, maintaining a career library, and providing job search counseling. Support is given to the academic areas by providing placement information to faculty and facilitating employer and faculty interaction.

**Special Facilities**

**Bartlett Center for the Studio Arts and the Gardiner Art Gallery**

Old Gardiner Hall, as the Bartlett Center was formerly known, was built in 1910 as a women's residence hall and has served also as a classroom building for women's physical education, speech, agriculture extension and the college of business. The building was named to recognize Maude Bartlett, founder of the University's home economics program. Gardiner Hall was renamed the Bartlett Center when Mr. & Mrs. F. M. "Pete" Bartlett gave Oklahoma State University a generous gift designated for the renovation of the Hall. The Bartlett Center has greatly enhanced the image of the visual arts at OSU. The Center provides activities which have brought regional recognition to OSU in the visual arts. The Center contains eleven new studios, custom designed for specific activities. Special studios include oil painting, watercolor, graphic design, and drawing. In addition to studio space, the center provides a 100 seat auditorium with rear screen projection, Art Department faculty offices and the Gardiner Art Gallery. The Gallery provides year-round exhibitions of regional and national importance to which the public is invited. Exhibitions have included the work of Manuel Neri, Deborah Butterfield, and traveling exhibitions such as "American Works on Paper: 100 years of American Art," and "Watercolor U.S.A." Faculty and student work is also exhibited on a regular basis.

**Bartlett Independent Living Laboratory**

In 1988, a residential structure owned by the University was renovated and renamed the Bartlett Independent Living Laboratory. The renovation was funded by a generous gift from the F.M. "Pete" Bartlett family. Furnishings and equipment have been provided by cash and in-kind gifts from a wide variety of corporate and individual donors. The purpose of the laboratory is to demonstrate ways that handicapped and older persons can live independently, comfortably, safely, and securely in the environments of their choice. Features of the lab include low thresholds, wide doorways and hallways, universal hardware; computerized environmental control systems; motorized windows, blinds, and draperies; special features for visually and hearing impaired; adjustable-height work centers; and numerous examples of devices that help with daily living skills.

The laboratory is used daily by students and faculty from various disciplines. Visitors to the laboratory have included home builders, architects, interior designers, professionals who work with handicapped and older clients, families who want to build new homes or adapt present homes, inventors, engineers and others. The laboratory, nicknamed "Independence Hall," is open by appointment, Monday through Friday 8:00 a.m. - 5:00 p.m. Appointments may also be arranged on weekends.

**Colvin Physical Education Center**

The Colvin Physical Education Center, one of the finest facilities in the nation, encompasses a wide variety of organized and informal recreation activities for all OSU students. It houses the School of Health, Physical Education and Leisure, which includes the academic program, as well as recreation, intramurals, sports clubs, non-credit activity courses and outdoor adventure programs. Activity areas available include racquetball, indoor and outdoor swimming, gymnastics, fencing, billiards, dance, golf, table tennis, wrestling, weight-lifting, basketball, volleyball, badminton and squash. Intramural programs are conducted for women, men and co-rec (coed) teams.

Outdoor facilities available for student recreation use include tennis courts, basketball courts, archery range, golf driving range, jogging track and fields for soccer-rugby-football and softball. Facilities are also available at Lake Carl Blackwell and Camp Redlands for sailing, canoeing, and crew. Additional information about recreation programs may be found in the "Student Life" section.

**Edmon Low Library**

Conveniently situated in the center of the campus, the attractive Williamsburg-style Edmon Low Library contains more than 1,450,000 volumes and over 14,000 journals which support the diverse academic and research programs of the University. In keeping with its tradition of service, the Library has a friendly and competent faculty and staff and on open-stack arrangement so that patrons may browse and select their own materials. The philosophy of service which underlies the Library's operation is also reflected in the number of reference desks located throughout the building, in the public service photocopy machines situated on every floor (5 cents per copy), in the more than 110 hours that the Library is open each week that classes are in session, and in the extended hours during final examination time at the end of the fall and spring semesters.

Students, particularly those who are new to the campus, are encouraged to visit the Library. A good place to begin the visit is the Information Desk on the second floor. Floor plans and guides to locating different types of material are available near this desk. In addition, throughout the year librarians help acquaint students with library resources by providing presentations at faculty request to classes preparing to do research.

**Documents.** Located on the fifth floor of the Library, the documents collection, considered by many to be the best in the Southwest, contains information on almost every subject. The Department serves as a patent depository library and houses over four million U.S. patents. The docu-
ments area also serves as a depository for all publications distributed by the United States Government Printing Office and the State of Oklahoma. Nondepository materials acquired from federal agencies supplement the depository collection. Publications of states, foreign governments, and international organizations are obtained to support fields of special interest to the University.

Maps. The Map Room houses one of the largest and most comprehensive collections of maps in the state. This collection contains more than 60,000 maps, as well as aerial photographs of Oklahoma. The Map Room is a depository for maps from both the Defense Mapping Agency and the United States Geological Survey. The collection provides complete USGS topographic coverage of the United States.

Microforms. Numerous manuscripts, research reports, theses, books, periodicals, documents, and newspapers are available on the more than 2,100,000 pieces of microform which are housed in the Microform and Media Room and the Documents Department. In addition to the back files of newspapers on microfilm, including the New York Times and the London Times, the collection in the Microform and Media Room also contains large sets of material on microform, such as Landmarks of Science, Early American Imprints, Early English Books, U.S. Patents, and Western Americana. Staff members are available to locate material, to make paper copies from microfilm and microfiche, and to assist patrons with questions.

Interlibrary Loan. Interlibrary loan service is available at the Library to students and faculty for obtaining material they need to carry out advanced University-related research. All borrowing and photocopying is done within the provisions of the General Interlibrary Loan Code of the American Library Association and those of the Oklahoma State Interlibrary Loan Code. Inquiries regarding this service may be made at any subject-division reference desk or at the Interlibrary Loan Office.

Special Collections. The Special Collections area contains a diverse group of noncirculating collections which relate to OSU and its history, Oklahoma history, rare books and manuscripts. Books and journals in the OSU, Oklahoma, and Rare Book Collections are listed in the main card catalog. Special finding aids and indices are available in the Special Collections area for locating uncataloged material in the OSU collection, the vertical file collections and the manuscript collections. The latter contains the papers of two former Oklahoma governors, Henry S. Johnston and Henry L. Bellmon. The Special Collections area, which provides a reading room for patrons using this material, is on the third floor of the Library.

On-line Services. The Library provides three kinds of computer-assisted search services which are described below. An on-line catalog will be available through computer terminals located near the Information Desk on the second floor. The screen displays are intended to be "user friendly" and to provide helpful prompts regarding the search forms and procedures. Assistance in the use of the on-line database will be available at the Information Desk. The database contains all of the materials which are listed in the card catalog, some government documents, microforms, maps and Curriculum Materials Laboratory items.

An ON-LINE computer-assisted literature search and retrieval service provides instantaneous access to more than 2,000,000 records in computerized data bases located in different parts of the United States relating to nearly every area of campus teaching and research interest. The service is available to interested students who are willing to pay for the on-line computer and communications time and any off-line printing that may be requested. Inquiries concerning ON-LINE should be directed to the appropriate reference desk where more detailed information is available.

CD-ROM products are available in several areas of the Library and users may have direct access to them. Databases currently available include AGRICOLA, ERIC, Dissertation Abstracts, and Infortrac.

M. B. Seretean Center for the Performing Arts

The M.B. Seretean Center for the Performing Arts provides a modern and well-equipped home for the Music and Theater departments. Constructed in 1970 at a cost of three million dollars and named in honor of its principal benefactor, M.B. "Bud" Seretean, a 1947 OSU graduate, the Center is the focal point of all major dramatic and musical events on the OSU campus. The center's 75,000 square feet include a 900-seat auditorium and a 600-seat continental theater, which attract a myriad of fine arts activities such as ballet, concerts, mime, opera, plays, faculty and student recitals and a host of summer conventions.

In addition to the auditorium and theater, the Seretean Center houses teaching studios for music, a variety of classrooms, a specially-designed choral room, a rehearsal hall for band and orchestra, costume and scene shops, and a well-equipped audio center, all designed to provide the best atmosphere in Oklahoma for the teaching of the fine arts.

Museum of Higher Education in Oklahoma-Old Central

Old Central, the oldest building on campus (1894), was placed on the National Register of Historic Places in 1971; it is now operated by the Oklahoma Historical Society as a museum. The building presently exhibits relating to OSU's early history, and some rooms have been recreates as they would have been in 1894. Traveling exhibits are also presented on various subjects.

Information and exhibit materials are being collected from other higher education institutions around the state; when completed, the Museum of Higher Education in Oklahoma will be the only museum offering a comprehensive history of higher education for an entire state. There will be permanent and rotating displays portraying the development of the educational system from Oklahoma and Indian Territory days to the present.

The museum is open to the public Tuesday - Friday, 9:00 a.m.-5:00 p.m., and Saturday and Sunday, 2:00-5:00 p.m. Special tours and slide presentations are available for groups by appointment. The Assembly Room, on the second floor, may be reserved by non-profit groups and organizations.

Student Union

The primary purpose of the Oklahoma State University Student Union is to serve the members of the University community through an organization which provides a myriad of necessary and convenient goods and services; offers programs to enhance the educational, social, cultural, and recreational development of individuals; and fosters an atmosphere conducive to open interaction and exchange among all students, faculty, staff, alumni and guests.

Dating back to 1815, college unions have always been thought of as "places where all may meet on common ground." In their early years, the college unions were debating halls for university students. Through the years, student unions have added to these halls such facilities as recreation centers, dining halls and meeting rooms. Today student unions bring together students, faculty, staff, alumni and guests in a friendly, casual atmosphere. They are not merely buildings, but serve as the community center "the heart of the campus."

The OSU Student Union is certainly no exception to this tradition as it has been serving the University community and state since opening in 1950. With a facility consisting of 543,441 square feet, it stands as one of the largest and most comprehensive unions in the world. It provides the University with such services as an 81-room hotel, a variety of lounges, a theater, an art gallery, extensive food services, a shopping mall, a recreation center, a bookstore, a post office, a travel agency and many University offices.

The Student Union is the center of student activities as it houses the offices for most student organizations. Many activities such as movies, dances and speakers are provided for students by the Union's student programming organization, the Student Union Activities Board.

As Oklahoma State University's conference center, the Student Union hosts many continuing education conferences throughout the year. The variety of meeting rooms located throughout the Union are also available for student and faculty use free of charge.

Although the OSU Student Union has an annual budget of approximately $9 million, less than 10 percent of the total cost of operating the Union is funded from student fees. As the Union receives no state funds for its operations, the remainder of its budget is generated from the sale of goods and services, thereby making it virtually a self-supporting University facility.

Telecommunications Center

The Telecommunications Center is a visible commitment to the University's desire to keep pace with the communications revolution. Educational Television Services (ETS) occupies a majority of the facility and is equipped with two independent, fully operational studios with a capacity of
eight cameras. There are two off-line and one on-line editing suites and two remote camera units. ETS has the ability to transmit or receive on either the C-band or Ku-band satellite format, including from remote locations using a Ku-band satellite truck. ETS produces over 500 live and tape programs per year consisting of video teleconferences, educational programs, documentaries, video training tapes, and public service announcements for the University, state agencies and for state and federal grants.

ETS employs a full-time staff of 18 in the areas of production, engineering and art. Each of these areas is also staffed with students working to earn practical experience under the guidance of professionals. For those students who meet the prerequisites, who are conscientious and who are willing to work, there are three methods of entry into employment at ETS. One method is through an internship which allows the student to earn college credit. Another method is through part-time employment at ETS, usually reserved for those students who have completed an internship, and the third is through the University's work-study program.

Campus Recreation

Health and Fitness Center

The Health and Fitness Center hosts a variety of adult fitness and exercise programs. Housed in the Colvin Physical Education Center, the Health and Fitness Center provides a complete Adult Fitness Evaluation for persons on campus, in the Stillwater area, and in communities outside the Stillwater area utilizing the Mobile Laboratory.

The Cardiac Rehabilitation Unit is a part of the Health and Fitness Center and provides aggressive Phase II and III cardiac rehabilitation for patients in the Stillwater area.

In addition to the aforementioned programs, the Health and Fitness Center also provides several credit and non-credit classes in contemporary health issues. This unique combination provides many opportunities for students to receive practical "hands-on" experience with scientific testing equipment and actual patients and clients on a day-to-day basis.

Campus Recreation Program

Campus recreation programs are designed to provide equipment, space and professional assistance in helping University students and staff members and their families pursue individual recreation interests. Located in the Colvin Center and Annex are facilities for 32 activities including racquetball, gymnastics, basketball and swimming. In addition, areas for soccer, football, rugby, softball, archery, tennis, jogging, sailing, canoeing and hiking are made available for student and staff use.

Recreation. Through the recreation program, the staff of the Colvin Center offers a variety of non-credit instructional programs each semester to students, faculty, staff and their dependents. Specialty services include poolside dances and movies, International Olympics, married student recreation, freshman programming, and extension services for visiting groups. Instructional programs for adults include yoga, noon fitness, evening fitness, beginning karate, advanced karate, tennis, racquetball, swimming, scuba, water exercises, exercise to music, aerobic dance, weight training, massage, country swing, ballet and belly dancing. Instructional programs for dependents include beginning gymnastics, intermediate gymnastics, beginning swimming, intermediate swimming, karate, creative dance and rhythmic gymnastics (3-4 years). Free children's activity programs are offered prior to the dependent's instructional program each Saturday morning.

Intramurals. The intramurals program at Oklahoma State University is an important part of student life on campus. The goal is to offer a wide variety of sports experiences for each student, regardless of skill or ability, to develop carry-over sports skills for life, to encourage physical activity, to develop habits of fair play and to provide for leadership development. Programs are available for both men and women (23 different activities), as well as participation in co-recreational activities.

Sports Clubs. The campus recreation program advises and helps organize the active sport clubs on campus, which are governed by the Sports Club Council. The Council is chartered by the University and its officers are elected students. This Council develops sports club policies, sets priorities and functions as the official representative for all sports clubs. The campus recreation program provides the adviser for this Council. Membership in all sports clubs is open to all students. If a group of students is interested in starting a sports club, the coordinator will assist them.

Active sports clubs are Auto Club, Bowling, Crew, Cycling, Fencing, Karate, Lacrosse, Racquetball, Rugby, Sailing, Scuba, Skydiving, Soccer, Snow Skiing, Volleyball, Waterskiing, Weightlifting and Wilderness Pursuits.

Outdoor Adventure. Another thrust of the program is the OSU Outdoor Adventure Program. Organized trips are led by professional staff and trained students. The student's choice of activity will lead to the top of the mountains, over rocks and down rivers. The wilderness trips are designed to offer an opportunity for developing outdoor skills, but even more importantly, to develop and explore the individual, other people and the surroundings.

A children's summer camp at Camp Redlands, Lake Carl Blackwell, and a challenge ropes course at the Redlands site as well as the OSU Aquatic Center (Lake Carl Blackwell) are included in the varied offerings. The management and development of the 80-acre Camp Redlands for use by University and community groups has recently been incorporated into this program.

An extensive rental and purchase of quality outdoor equipment is available in the Colvin Center.

Film Series

There are several regularly scheduled film programs on campus, in addition to individual films scheduled by campus groups. The primary sponsor of the popular film series is the Student Union Activities Board. This series features popular films, many of which are still being shown in commercial theaters. A classic film series is sponsored by the Department of English. This series brings the best of foreign and classic films to campus.

The Arts and Sciences Film Series presents screenings of six international films during the regular semester, three during the summer session. Season subscriptions as well as single admissions are available. The Series devotes itself to films otherwise unavailable in Stillwater, whether motion pictures from abroad (all foreign language films have English subtitles) or from the U.S. At least two films each season are recent Academy Award winners or nominees for Best Foreign Film. The Series occasionally co-sponsors lectures by visiting filmmakers.

Greek Organizations

The fraternity and sorority system is and has been a viable part of Oklahoma State University since 1917. There are approximately 3500 men and women who are members of the 24 national fraternities and 14 national sororities. The majority of these Greek letter organizations own their own houses which are considered by the University as University-recognized housing. The primary thrust of the Greek system is to enhance and promote brotherhood/sisterhood, academic achievement, leadership and social awareness. Fraternities have an informal rush and normally contact potential members during the spring and summer months. Sororities hold a formal rush which traditionally begins in late August. For additional information on the Greek system or how to apply for rush, write to the Office of Greek Life, 050 Student Union.

Student Life

Allied Arts

A unit of the Office of Student Activities, Allied Arts has the responsibility of developing and implementing for the University a diversified program in the performing arts. This includes musical performances from orchestras to quartets and soloists. Allied Arts has also brought to campus outstanding dance and theatrical companies. Each year, Allied Arts schedules five to six performances for the campus community.
Honor and Service Organizations
OSU offers opportunities for personal and professional development through many nationally-affiliated honor and service organizations. These organizations provide opportunities for leadership and program development, new friendships and recognition of achievement. University-wide organizations include:

- Alpha Phi Omega (service organization)
- Blue Key (Junior and senior honor society)
- Golden Key (Junior and senior honor society)
- Iota Kappa (Sophomore honor society)
- Mortar Board (Junior and senior honor society)
- Orange and Black Quill (Honor society for sophomore women)
- Order of Omega (Honor society for sorority and fraternity members)
- Phi Eta Sigma (Freshman and sophomore honor society)
- Phi Theta Kappa Alumni Association (Honor society for transfer students)

(See college sections for organizations within each college.)

Lectures
Oklahoma State University, through its academic organizations and student groups, has a significant number of speakers each year, enriching the intellectual life on campus. Individuals, from both off-campus and on-campus, share their expertise with faculty, students, staff, and town's people on a wide variety of topics.

Many of the academic units as well as student groups invite speakers to their meetings in order to enhance the educational component of the University. These lectures are generally of interest to specific academic areas, rather than to the general campus. The Student Government Association, through its Forum Committee, brings major figures in politics, entertainment, and business to the campus. The Student Union Activities Board also has a speaker's program related to topics of general student interest. Other student organizations conduct active lecture programs of general interest.

Allied Arts conducts lecture-demonstrations in conjunction with a number of its classical arts performances. In this manner, students can gain additional knowledge of classical arts and artists.

Religious Life
Campus religious centers, supported by state and national church bodies specifically to serve the University community, provide opportunity for worship in both traditional and contemporary services; religious education commensurate with higher learning for the development of the whole person; counseling that maintains a spiritual basis for the cohesion and meaning of life; and social activities which allow relationships and life views to deepen. The 18 religious centers have strategic locations close to campus and, in addition to their own ministry, coordinate many of their efforts with each other and the University administration through the Association of University Ministers.

Residential Life
Residence halls are a popular place to live on the OSU campus. The housing and food service program has a proud tradition of excellence recognized nationwide. Much of the success of the residence halls is the strong and vital student government system consisting of floor government, house councils for each hall or complex and the Residence Halls Association, which represents all halls on campus.

The Residence Halls Association acts as the voice of residence hall students to the University administration concerning policies and regulations, and coordinates campus-wide activities for the enrichment of residence hall life and the improvement of residence hall living. All residence halls on campus combine to form the Residence Halls Association (RHA). Each hall has its own elected officers and constitution, and is a part of the RHA system of representative government. There are numerous opportunities for involvement in the hall, such as floor officer, social committees, food committee, and sports and athletic activities. Living in a residence hall is not so much different than living in a city or a town elsewhere, in terms of community. Residence hall living is a community of people who live and interact with each other daily and who can work together to make their hall a “home away from home” and be proud of it.

Theater
The four to six plays produced each year range from classical to contemporary; from sublime to ridiculous; from high seriousness to low comedy. So too, variety in casting is assured by a policy of choosing actors from the entire range of the OSU student body, regardless of major. While one play may be of greatest interest to students of history or philosophy, the next may appeal most to those who need escape for an evening’s light entertainment.

OSU Theater extends beyond OSU student productions in the Sertean Center. In recent years the local department has hosted statewide versions of the American College Theater Festival, displaying outstanding theater from other Oklahoma colleges and universities enroute to regional and national festivals.

Alumni Programs and Services
The Alumni Association serves as a liaison between OSU and its former students, and provides members immediate and direct contact with the University. The Association operates for the benefit of both former students and Oklahoma State University.

All graduates, former students, and friends of OSU are eligible for membership in the Alumni Association by paying an annual or life membership fee.

The OSU Alumni Association is governed by a Board of Directors. The director of Alumni Relations also serves as executive director. Three program directors, a records coordinator, and an administrative associate serve as staff.

The Alumni Association promotes involvement of alumni and friends in many ways.

Clubs. There are approximately fifty alumni clubs in the state of Oklahoma. Other clubs are located across the United States. Club activities include membership drives, social functions, and other programs to support OSU.

Homecoming and Reunions. Alumni are invited to return to campus to renew friendships and participate in a series of informative and social activities.

Travel. The Alumni Association organizes travel packages designed to meet educational and social objectives of alumni and friends.

Awards and Recognition. Each year students and alumni are honored for outstanding service to OSU or for outstanding personal achievement.

Publications. O'Stater tabloid and Outreach magazine are publications that are sent to all Association members. These publications provide information about the University and alumni programs.

The Alumni Office is located in Room 212 of the Student Union. Opinions and suggestions are welcome and will receive the full attention of the professional staff.

OSU Foundation
The primary objective of the OSU Foundation is to independently generate, manage and prudently disburse funds raised for a wide variety of programs, including scholarships, student aid, faculty awards, library and museum acquisitions, varsity athletics and capital improvement projects.

Established in 1961 as an independent, private, non-profit corporation, the OSU Foundation operates on behalf of Oklahoma State University.

The private funds raised by the OSU Foundation enable Oklahoma State University to provide a high quality education. The efforts of the OSU Foundation help meet the ever-changing needs of education and enrich higher education for the ultimate benefit of the citizens of Oklahoma.
The Technical Branch, Oklahoma City

James E. Hooper, Director and Vice-President of Oklahoma State University
Don E. Connel, Assistant Director for Academic Affairs
Joe D. Kinder, Assistant Director for Business and Finance
Carla C. Spleanard, Assistant Director for Student Affairs
Evelyn H. Wilson, Director of Admissions and Records

The University Technical Branch, Oklahoma City, is a part of Oklahoma State University and is accredited by the North Central Association of Colleges and Secondary Schools.

The Technical Branch has become the institution most directly related to the education of technicians in the United States. It offers college courses leading to an associate degree, preparatory to bachelor's degree programs and general education courses.

The new Branch offers two-year programs leading to the associate degree in accounting technology; architectural technology; civil/surveying technology; computer programming with emphasis in accounting, business, scientific or operations management; construction technology; electronics technology; environmental systems technology; equine racing with race track management emphasis; fire protection technology; general engineering technology; horticulture technology; industrial loss prevention technology; industrial drafting and design technology; instrumentation technology; interpreter training; management technology; municipal fire protection technology; nurse science; oil and gas management technology; police science; residential construction design technology; technical writing; and transportation and traffic management.

Teaching methods emphasize the application of theory through state of the art laboratories and equipment. The faculty are working professionals with in-depth business and industry experience in their areas of expertise.

The curricula are designed to prepare graduates for a variety of positions in business, government and industry. Specialized technical courses enable the graduate to understand the underlying purposes of the operations and functions for which he or she is responsible and to utilize basic scientific principles in developing ideas. General courses in communication skills, personal development, and social and economic principles broaden the graduate's interests and aid him or her in the further development of his or her abilities.

The Oklahoma State University Technical Branch is located at the crossroads of Oklahoma City, Interstate 44 and Interstate 40, at 900 North Portland, Oklahoma City, Oklahoma, 73107.
6. Grades and Grading
6.1 Official Transcripts
6.2 Grade Interpretation
6.3 Grade Point System
6.4 Grade-point Average Calculating
6.5 Freshman Progress Reports
6.6 Pass-no pass Graduating System
6.7 Pass-fail Graduating System
6.8 Grade Reports
6.9 Correcting Grades Reported in Error
6.10 Grade Appeals
6.11 Honor Rolls
6.12 Academic Dishonesty or Misconduct

7. Graduation
7.1 Graduation Requirements
7.2 Residence Requirements
7.3 College Enrollment Requirement
7.4 Residence Waiver for Certain Premedical Students
7.5 Minimum Hours for Graduation
7.6 Grade-point Average for Graduation
7.7 Payment of Graduation Fees
7.8 Requirements for Honors Degree
7.9 Diploma Application
7.10 Presence at Commencement Exercises

In addition to these minimal regulations, there may be additional college, department or program requirements which apply. Students are advised to review all steps of their academic progress with their academic advisor.

1. Admission-Withdrawal

1.1 Admission of Freshmen. Policies and procedures governing the admission of new freshmen are detailed in another section of the Catalog. (See "Admission" section.)

1.2 Admission of Transfer Students. Policies and procedures governing the admission of transfer students are detailed in another section of the Catalog. (See "Admission" section.)

1.3 Admission to Certain Professional Programs. Admission to certain programs as approved by the University may be restricted. (See "Admission" section and college sections in the Catalog.)

1.4 International Student English Proficiency Requirement. As a condition of admission to undergraduate study at OSU, all persons for whom English is a second language shall be required to present a score of 500 or above on the Test of English as a Foreign Language (TOEFL) regardless of the number of semesters or terms completed in other institutions of higher education or previous enrollment in English language programs. (See "Admission" section of the Catalog.)

1.5 Satisfactory Academic Progress. Students not under academic suspension from the University are judged to be making satisfactory progress toward their educational objectives. They are eligible to enroll in any of the undergraduate colleges except as may be restricted. (See "Admission to Certain Professional Programs.")

1.6 Scholastic Requirements for Continuing Enrollment of a Student under Academic Probation in an Undergraduate College. A student shall be classified as "full-time" when the grade-point average of the last semester attempted is less than 2.00 or as determined by an individual college. A student enrolling on probation should seek help from an academic adviser and a counselor in the University Counseling Services when deciding on academic load and extracurricular activities. A student whose poor grades may have been caused by health problems should seek the help of a physician.

1.7 Academic Suspension. A student will be suspended when he or she earns less than a 2.00 grade-point average over the last semester attempted and (a) the cumulative grade-point average for the last two semesters is less than 1.40, or (b) the cumulative grade-point average for the last two semesters is less than 2.00 and the cumulative grade-point average for six hours attempted falls below the following:

- Total hours: Minimum grade-point average required
  - fewer than 24: 1.40
  - 24 or more: 1.80
  - over 72: 2.00

A student who at any time does not make satisfactory progress toward an approved educational objective will, at the request of the dean of the college, be suspended from the University. A student who fails to meet the conditions of probation will be suspended.

1.8 Reinstatement after Academic Suspension. A student who has been suspended from the University for academic reasons may not ordinarily be readmitted sooner than one year from the date of suspension. Reinstatement may be considered by the dean of the college in which the student wishes to enroll and on the merits of the individual case.

1.9 Readmission. Students who have attended OSU but were not enrolled during the immediate past semester must file an application for readmission. A student who has attended another college or university since last attending OSU, must file a transcript of all work taken elsewhere. Admission status will be determined after an evaluation of the previous work has been made.

1.10 Withdrawing from the University. The withdrawal process is initiated in the student's dean's office. A student who withdraws prior to the end of the sixth week of a regular semester or the third week of a summer session may receive a grade of "W" (withdrawal). A student who withdraws after the sixth week of a regular semester or the third week of a summer session but prior to "Pre-finals Week," will receive a grade of "WF" (withdrew failing) as assigned by the instructor of each course. The grade of "WF" will be calculated in the grade-point average. After the beginning of "Pre-finals Week." a student may not withdraw from the University and shall be assigned only the grade of "A," "B," "C," "D," or "F" or (when appropriate) "I," "NP," "P," or "R" by the instructor of each course at the end of the semester or summer session.

2. Student Status

2.1 Classification of Students. Undergraduate classification is determined by the criteria below:

- Freshman: fewer than 28 semester credit hours passed
- Sophomore: 28 to 59 semester credit hours passed
- Junior: 60 to 93 semester credit hours passed
- Senior: 94 or more semester credit hours passed

2.2 Full-time Students. Regular semesters: undergraduate students who are enrolled in 12 or more semester credit hours are classified as "full-time" students. Graduate students enrolled in nine or more semester credit hours are classified as "full-time." Summer session: undergraduate students who are enrolled in six or more semester credit hours, or graduate students who are enrolled in four or more semester credit hours, are classified as "full-time.

Students engaged in an internship or cooperative education program assignment that requires full-time work on the assignment are regarded as full-time students when they are enrolled in the number of credit hours deemed appropriate for the academic credit they receive for the assignment. A student holding a 0.50 FTE graduate assistant appointment, and enrolled in a minimum of six hours during the fall or spring semester, and four hours during the summer semester, will be classified as a full-time graduate student. Any FTE appointment less than 0.50 requires nine hours of enrollment for the fall or spring semester, and four hours during the summer semester in order for the student to be classified as a full-time student.

2.3 Part-time Students. Students who are enrolled but not meeting the definition of full-time students are classified as "part-time." Undergraduate students are classified as "half-time" if they are enrolled in six hours in a regular semester (or three hours in a summer session). Graduate students are classified as "half-time" if they are enrolled in four hours in a regular semester (or two hours in a summer session).

2.4 Special Students. A student who does not have immediate plans to enter a degree program but wants to take courses, may be classified as a "special student." A student on an F-1 visa may not enroll as a special student since he or she must be admitted to a degree program.

3. Requirements

3.1 Date of Matriculation. Matriculation occurs when a student first enrolls in an accredited institution of higher education. That date will be used in calculating the time limit for the use of a given plan of study.

3.2 Changes in Degree Requirements. When a student first enrolls at OSU, the degree requirements are made available. Although the curriculum may be revised before a student graduates, a student who makes normal progress toward graduation (completing a four-year degree in not more than six years) will be held responsible for the degree requirements in effect at the time of matriculation, and any changes that are made, so long as these changes do not result in semester credit hours being added or do not delay graduation. A student has the option of adopting the new requirements that have been established since matriculation.

3.3 Honors Programs. (See "Honors Programs" in the Catalog.)

3.4 General Education Requirements. Each college determines and publishes the general education requirements for its degree programs. College requirements may exceed the minimum for general education established by the University, which are: (a) 40 semester credit hours, including six semester credit hours of English composition and 34 semester credit hours of breadth requirements, (b) an international dimension requirement, and (c) a scientific investigation requirement. The 34 semester credit hours of breadth requirements must include three semester credit hours of American history (HIST 1103 or 1483 or 1493),

26 The University
and three semester credit hours of American government (POLSC 1013), and, in addition, at least three semester credit hours of designated general education courses in each of the following areas: Social and Behavioral Science, Humanities, Natural Sciences, and Abstract and Quantitative Thought. At least 15 of the 34 semester credit hours must be in disciplines not directly supporting the baccalaureate of the student.

The International Dimension requirement (the equivalent of at least three semester credit hours in courses approved as having an international dimension) and the Scientific Investigation requirement (one course approved as having an investigative laboratory or comparable experience in scientific methodology) may be satisfied in any part of the student’s degree program.

A course in a breadth area not designated for general education purposes may be substituted for a designated course in the same breadth area when this is justified on educational grounds specific to an individual student. Such a substitution requires the recommendation of the student’s academic adviser and dean and the approval of the vice president, Office of Academic Affairs and Research.

Courses used to fulfill general education requirements are identified by code letters which appear preceding the course titles listed in the back of the Catalog and in the class schedule. The code letters designate the general education category for which the course may be used:

- A: Abstract and Quantitative Thought
- H: Humanities
- I: International Dimension
- L: Scientific Investigation
- N: Natural Sciences
- S: Social and Behavioral Sciences

Specially designated courses in the categories A, H, N, S which have been designed especially to provide general education experiences to students outside their major field are marked with SpD.

3.5 English Composition Requirement. The University requires a minimum of six semester credit hours in English composition for a baccalaureate degree. The required sequence of courses is ENGL 1113 and ENGL 1213. For those who qualify, ENGL 1013 or 1313 may be substituted for ENGL 1113. Students who earn an "A" or "B" in ENGL 1113 (or ENGL 1013 or 1313) or who earn three semester credit hours in English composition for a bachelor’s degree. A minimum of 30 semester credit hours of additional work, including all requirements of the second bachelor’s degree, is required. The Bachelor of University Studies degree has separate requirements.

4. Credits

4.1 Residence Credit. Residence credit is awarded for work taken on campus (not through extension or correspondence) or at a location officially designated as a residence center by the governing board of the institution (e.g., in-state military bases and OSU courses at the University Center at Tulsa).

4.2 Extension and Correspondence Credit. Academic credit is awarded for courses offered through the extension offices of the six colleges, by the independent and correspondence study center of OSU, or by transfer of work certified as extension or correspondence credit by another fully accredited institution.

Extension Credit. OSU will accept, toward a degree, a maximum of eight semester credit hours earned through extension at another institution if that institution is fully accredited. Credits earned through extension plus any earned through correspondence cannot exceed one-fourth of the credits required for a bachelor’s degree.

Correspondence Credit. OSU will accept, toward a degree, a maximum of eight semester credit hours earned through correspondence at another institution if that institution is fully accredited. Credits earned through correspondence plus any earned through extension cannot exceed one-fourth of the credits required for a bachelor’s degree.

4.3 Transfer Credit from Other Accredited Four-year Institutions. Except as excluded in the section on "Transfer of Credits from Junior Colleges" and "Residence Requirements," credits transferred from accredited senior colleges will apply toward baccalaureate degrees in the same way that they would have applied had they been earned in residence at OSU. Students may not use transfer credits to satisfy more than one-half the major course requirements for a department unless they have the approval of the head of that department and the academic dean.

4.4 Transfer Credit from Junior Colleges. Credits will be accepted by transfer from a junior college to meet lower-division (i.e., 1000- and 2000-level courses) requirements only. A minimum of 60 semester credit hours must be earned at a senior college. Under these guidelines, transfer credits are subject to the individual colleges’ degree requirements.

4.5 Transfer Students with Less than a "C" Grade Point Average. Students who are accepted with a transcript with a grade-point average below “C” will be placed on academic probation.

4.6 Advanced Standing Credit. Any currently enrolled student whose travel, employment, extensive readings or educational experience appear to have given the student proficiency in a subject that is offered at OSU, equivalent to the proficiency ordinarily expected of those students who take the subject in a regular class, may apply for an examination on the subject. Credit will be recorded with a grade of “P” if the student performs better on the examination. In order to qualify for an advanced standing examination, the student must:

(a) be enrolled at OSU.
(b) need no more semester credit hours at OSU (excluding the hours in which currently enrolled) toward meeting the requirements for the degree. These 15 hours must be resident course work, i.e., exclusive of transfer, correspondence, extension or advanced standing credit hours. (See “Residence Requirements.”)
(c) need the course to meet some requirement for a certificate or degree that is being pursued at OSU.
(d) not have taken an examination over the course within the preceding six months.
(e) have the recommendation of the Registrar and the approval of the department in which the course is offered.
(f) have paid the fee of $5.00 per credit hour. (This fee is not refunded even if the student receives no credit.)

Advanced standing credit awarded to a student must be validated by successful completion of 12 or more semester credit hours of academic work before the credit is placed on the student’s transcript. No more than 15 advanced standing credit hours may be applied to the student’s degree program subject only to meeting the residency requirements of OSU.

4.7 Validation Examination Credit. A student who has earned credit in a course which OSU refuses to accept, because the institution at which the course was taken was not accredited, may apply for a validation examination. In order to qualify for a validation examination, a student must:

(a) be enrolled at OSU at the time the student takes the examination.
(b) present the necessary evidence to prove that the course is equivalent in substance.
(c) get approval from the Office of the Registrar and Admissions, the dean and head of the department in which the course is offered to take the examination.
(d) take the examination within the first semester after entering OSU.
(e) take only one such examination in each subject.

The student secures the forms for the examination at the Office of the Registrar and Admissions. The dean of the college in which the course is offered appoints a committee of three to construct, administer and evaluate the examination. The result is reported to the Office of the Registrar and Admissions where a “P” grade is recorded if the examination result is “C” or above.
4.8 Graduate Credit Hours for a Senior. A senior who is graduating from OSU at the end of a summer session may take a limited number of courses for graduate credit during the last two semesters or summer sessions. The written request to receive graduate credit must be made before the fifth week of the third week of a summer session. Such credit may be earned under the following conditions: (a) the student must meet the admission requirements and be subject to the same possible probationary or provisional restrictions as students admitted in graduate status. The student must achieve an overall 3.00 grade-point average in all courses and make a grade of "C" or better in those which he or she wants graduate credit; (b) the credits must not be required or needed for the bachelor's degree; (c) the total registration must not exceed 18 credit hours for a semester or nine credit hours for a summer session; (d) the student must either complete the requirements for the bachelor's degree at the end of the semester or summer session or be within 12 semester credit hours of completing such requirements at the beginning of the semester or summer session in which graduate credit is requested; (e) admission to courses taken for graduate credit must have the approval of the course instructor, the head of the department in which the courses are offered and the dean of the Graduate College; (f) not more than 14 semester credit hours taken while a senior may be approved for graduate credit, and a minimum of 14 semester credit hours the student must be in residence after the student registers in the Graduate College. Courses taken for graduate credit during the senior year may not be accepted for graduate credit at institutions other than OSU; (g) a grade of "D" may be made of the graduate courses will be determined by the adviser when the student registers in the Graduate College and submits a plan of study for an advanced degree.

4.9 Semester Credit Hour. A semester credit hour is equivalent to (a) 16 50-minute class sessions (including examinations) conducted under the guidance of a qualified instructor plus 32 hours of preparation time, or (b) 16 3-hour laboratory sessions, or (c) 16 2-hour laboratory sessions plus 16 hours of preparation time. These same equivalencies apply to extension courses, short courses and other learning formats for which academic credit is awarded.

4.10 Foreign Language Credit for Native Speakers. A native speaker of a foreign language cannot enroll in or earn credit toward graduation in lower-division (1000-2000 level) courses in that language. A native speaker of a foreign language is defined as a person whose high-school level instruction was conducted principally in that language. Native speakers may occasionally have valid reasons for establishing credit in a lower-division course. Requests for such consideration should be directed to the dean of the student's college for recommendation to the head of the Department of Foreign Languages and Literatures.

5. Registration

5.1 Course Numbering System. All courses are identified by numbers composed of four digits. The first digit indicates the class year in which the subject is ordinarily taken, although enrollment is not exclusive to students who have completed a full year of the course in any of the courses. The second and third digits identify the course within the field; and the last digit indicates the number of semester credit hours the course carries. For example, a course number 1123 should be interpreted as a freshman, or beginning, level course carrying three hours of credit. No course carrying with zero indicates that the course does not carry University credit. A course number ending in zero indicates that the course carries variable credit.

5.2 Maximum Semester Credit Hour Load. All semester credit hours above 19 (nine during a summer session) are excessive and require written approval in advance of enrollment by the student's adviser and the dean of the college. Excessive hours will be limited to the number of semester credit hours the student must be approved for graduate credit, and a minimum of 14 semester credit hours the student must be in residence after the student registers in the Graduate College. Courses taken for graduate credit during the senior year may not be accepted for graduate credit at institutions other than OSU; (g) a grade of "D" may be made of the graduate courses will be determined by the adviser when the student registers in the Graduate College and submits a plan of study for an advanced degree.

5.3 Adding Courses. A student who is graduating from OSU at the end of a summer session may add a course. The first day of the second week of classes of a regular semester or summer session is the last day a course may be added. A short course may be added no later than the first day of the short course.

5.4 Dropping Courses. At any time prior to the end of the first week of a regular semester or summer session, or during the proportionate period for block or short courses, a student may drop a course, and no record of the course will appear on the student's academic record. After the first week but prior to the end of the sixth week of a regular semester or the third week of a summer session, or proportionate periods for block or short courses, a student may drop a course and receive the grade of "W" (dropped). After the sixth week of a regular semester or the third week of a summer session but prior to the end of the tenth week of a regular semester or the fifth week of a summer session, a student may drop a course only with the written approval of the instructor ("WF" (dropping failing) as assigned by the instructor. The grade of "WF" will be calculated in the grade-point average. After the tenth week of a regular semester, or the fifth week of a summer session, or proportionate periods for block or short courses, a student may not drop a course and shall be assigned only the grade of "A," "B," "C," "D" or "F," or (when appropriate) "I," "NP," "P" or "R" by the instructor, on the reverse side, that it is appropriate for the course to be recorded on the student's transcript.

5.5 Concurrent Registration. A student who desires to earn credits concurrently at another institution or through correspondence, extension, advanced standing examinations, or DANTES (Defense Activity for Non-Traditional Education System) Examinations, must secure approval in advance from his or her dean if he or she expects this institution to accept those credits. Armed Forces personnel will be granted 60 days from the date of their first enrollment to establish, through DANTES examinations, advanced standing in subject matter that they mastered while in the Armed Forces.

5.6 Prerequisites to Upper-division and Graduate-division Courses. When no prerequisite is listed for courses numbered 3000 or above, it is understood that the prerequisite is 60 credit hours of work completed, or 45 credit hours of work completed with an overall grade-point average of 3.25. The prerequisite for courses numbered 5000 or 6000 is graduate standing in addition to any other prerequisites listed. Instructors may waive prerequisites when the student's background justifies. Prior approval of the instructor may be required in problems courses, independent study, internships, thesis and dissertation courses, and courses taught in a professional school.

5.7 Class Enrollment Maxima. The maximum numbers of students permitted to be enrolled in each section of a course is determined by the department head and can be increased or decreased only by the department head or dean.

5.8 Priority Enrollment. Priority enrollment addresses the needs of students in relation to graduation proximity, beginning with those students who have completed 15 or more credit hours for block or short courses, 45-74 credit hours, 30-44 credit hours, 20-29 credit hours, and 0-19 credit hours. Physically handicapped students are extended the option of priority enrollment. Those students currently in an OSU college who are extended the option of priority enrollment. Full-time employees of the University who have approval for enrollment and current OSU students who accept University scholarships will be given priority in turning in trial schedules for class assignments. Scholarships that qualify students for priority in turning in trial schedules are University band, athletic, and graduate teaching assistantships for teaching or research assignments. (These are not to be confused with scholarships that the student must require that the student perform a service for the University at a regular time specified by the University.) Working part-time for the University or outside the University does not qualify the student for priority in turning in a trial schedule.

5.9 Late Registration. A student is permitted to enroll during the first week of a semester or a summer session or on the first day of a summer short course. A student enrolling during the first week of a semester or a summer session will pay a special enrollment fee. The late enrollment fee will not be charged on or prior to the first day of a summer short course.

5.10 Payment of Tuition and Fees. Fees and tuition will appear on the regular monthly statement which is mailed to the student's local address. All fees and tuition associated with the student's enrollment are due in the Office of the Bursar no later than the first day of each month or within 30 days of each billing. All delinquent accounts in excess of the advance fee payment will accrue an interest penalty at the rate of 1 1/2 percent per month. Accounts must be cleared before the student can obtain a transcript. If any records, a transcript, receive a diploma, or enroll at OSU for a subsequent semester.

5.11 Audit. A student who does not wish to receive credit in a course may, with the approval of the student's advisor and the instructor of the course concerned, attend the class strictly as a visitor. A student who applies to audit a course promises that he or she will not use the audit as a reason to avoid the rule against excessive hours, and that he or she will not petition or ask in any way for the privilege of taking an examination to obtain credit after he or she has audited the course. The audit form is available in the Office of the Registrar. (Laboratory courses, private music lessons and art courses are not open for audit.) A student who has established a permanent record at OSU may have the audited course recorded on his or her transcript with "AU" appearing in place of the grade. Not later than one week after the close of that semester, the student must present to the Office of the Registrar the instructor's copy of the audit form with a signed statement from the student that he or she did not use the course.
6. Grades and Grading

6.1 Official Transcripts. All official transcripts of the student's academic record at OSU are prepared and released by the Office of the Registrar.

6.2 Grade Interpretation. The quality of student performance in all classes is indicated by the following letter grades: "A," "B," "C," "D," "F," "I," "P," "R," "W," "NP," "WP," and "WF." Descriptions of the grades are:

- Grade "A" Superior performance
- Grade "B" Good performance, but not superior
- Grade "C" Average performance
- Grade "D" Minimal passing performance
- Grade "F" Failing
- Grade "I." This grade is given to students who satisfactorily completed the majority of the course work and whose work averaged "D" or better, but who have been unavoidably prevented from completing the remaining work of the course. The conditions, including appropriate time limits, for the removal of the "I" are indicated on the official class roll by the instructor. A condition that the student must repeat the course in order to remove the "I" is not permitted. The maximum time allowed for a student to remove an "I" is one calendar year. The dean of the student's college may recommend to the Office of the Registrar the adjustment of this period in exceptional circumstances. It is the responsibility of the student to satisfy the requirements stipulated by the instructor at the time the "I" is assigned; it is the responsibility of the instructor to initiate action to remove the "I" as soon as possible after the student fulfills the requirement. The new grade does not result in the deletion of the "I" symbol from the transcript. Upon completion of the course requirements, a second entry is posted beside the original "I" on the transcript to show the final grade for the course. The incomplete grade which is not removed within the allotted period becomes a permanent incomplete.

- Grade "NP." This grade is given for unsatisfactory work (including that evaluated as "D") in courses on the pass-no pass grading system. Both credit hours and grade-points are ignored in calculating grade-point averages.

- Grade "P." This grade is given for passing work in OSU courses approved for pass-no pass and pass-fail grading systems. Both credit hours and grade-points are ignored in calculating grade-point averages.

- Grade "R." This grade is given to students in all thesis and dissertation courses (5000 and 6000) when course work is still in progress. It is the responsibility of the instructor to initiate action to have the grade entered as soon as possible after the student completes the course work. The new grade does not result in the deletion of the "R" symbol from the transcript, but a second entry is posted beside the original "R" on the transcript to show the final grade.

- Grade "W." This grade indicates that the student dropped the course.

- Grade "WP." This grade indicates that the student dropped the course while doing passing work.

- Grade "WF." This grade indicates that the student dropped the course while doing failing work.

Mark of "AU." An "AU" indicates that the student audited the course, and requested that it be recorded on the academic record. An "AU" is not a grade and is not used in calculating grade-point averages.

Mark of "N." An "N" indicates that at the time grades were due in the Office of the Registrar, a final grade was not reported by the student's instructor. An "N" is not a grade and will be changed to the grade earned within a reasonable time. It is not used in calculating grade-point averages.

6.3 Grade-point System. The following grade-point system is used in calculating the grade-point average:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Grade-point</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A&quot;</td>
<td>4.00</td>
</tr>
<tr>
<td>&quot;B&quot;</td>
<td>3.00</td>
</tr>
<tr>
<td>&quot;C&quot;</td>
<td>2.00</td>
</tr>
<tr>
<td>&quot;D&quot;</td>
<td>1.00</td>
</tr>
<tr>
<td>&quot;F&quot;</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot;I&quot;</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot;P&quot;</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot;R&quot;</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot;W&quot;</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot;NP&quot;</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot;WP&quot;</td>
<td>0.00</td>
</tr>
<tr>
<td>&quot;WF&quot;</td>
<td>0.00</td>
</tr>
</tbody>
</table>

6.4 Grade-point Average Calculating. In calculating grade-point averages for all purposes other than for graduation, the total number of grade points earned is divided by the total number of hours attempted; for graduation, the hours and points of the lowest grade(s) in a repeated course will be ignored. The grade of "I," "NP," "P," "R," "W," "WP," or "WF" will yield 0 grade points per semester credit hour.

6.5 Freshman Progress Reports. The faculty will report grades for freshmen on the dates as printed in the official University calendar. The date will not be changed to be earlier in any case. Students who have completed their courses under the same requirements as outlined above, with a grade-point average of more than 3.00 (i.e., all "A"s) are placed on the President's List of Distinguished Students. Students who have completed their courses under the same requirements as outlined above, with a grade-point average of less than 3.00 but a "C" or better in the last 12 semester credit hours in a regular semester or in a summer session with an overall (not cumulative) grade-point average of 3.00 or higher, and with no grade of "I" or "WF" in any course and no grade lower than a "C" are placed on the Dean's List of Distinguished Students.

6.6 Graduation Requirements. A student who completes the requirements for a degree at OSU will be awarded the degree. The degree for which a candidate has been graduated must be earned in residence at OSU. Under special circumstances, permission may be given to allow a student to graduate by correspondence. The candidate must be approved by the Academic Dishonesty Committee of the faculty. The candidate must also meet all other requirements as outlined above, with a grade-point average of 3.20 or higher, and must have met all of the prerequisites for enrollment in the course in question, (d) do not need the course in question for graduation or certification other than as a free elective, and (e) have approval of the academic adviser.

6.7 Pass-fail Grading System. Some courses are taught only on a pass-fail basis. Such courses are designated in the "Course Listings" section of the Catalog. Students who pass the course are awarded the grade of "P"; those who fail the course are awarded the grade of "F.""
to meet the graduation requirements at the close of the following summer session are invited and encouraged to participate in the Commencement exercises. Students who plan to meet requirements during the summer session (whether they are currently enrolled or not) should contact the Office of the Registrar to participate in Commencement. The University encourages all candidates for degrees to be present at the Commencement exercises. Attendance is not compulsory. However, candidates who cannot be present should notify the Office of the Registrar of the addresses to which diplomas can be mailed.

**Regents' Resolution on Disruption of the Educational Process**

A resolution of the Board of Regents for Oklahoma State University to further clarify existing student regulations, Section 1, “Legal Obligation of the Student,” as it pertains to the disruption of the educational process, was adopted in the regular monthly meeting at Stillwater, Oklahoma, on July 11, 1970:

Be it resolved by the Board of Regents of Oklahoma State University:

i. The following statement known as “Emergency Disciplinary Procedure in Cases of Disruption to the University’s Educational Process” containing the following provisions be enacted:

A. Definition of Disruptive Conduct

Oklahoma State University has long honored the right of the individual to free discussion and expression, of peaceful demonstration, and of petition and peaceful assembly. That these rights are a part of the fabric of this institution and of the nation as stated in the Bill of Rights is not questioned. They must remain secure. It is equally clear, however, that in a community of learning, willful disruption of the educational process, destruction of property, and interference with the rights of other members of the community cannot be tolerated.

B. Responsibility of the Student

Any student, who willfully by use of violence, force, coercion, threat, intimidation or fear, obstructs, disrupts or attempts to obstruct or disrupt, the normal operations or functions of the University, or who orally or in writing advises, procures, or incites others to do so, shall be subject to dismissal from the University.

C. Responsibility of the Board of Regents

The Board of Regents recognizes that by the Constitution and Statutes it has the power to make such rules and regulations for the management of the University as it may deem necessary and expedient, not inconsistent with the Constitution and laws of the state. While the Regents fully appreciate their obligations in this respect, they further recognize that in dealing with those offenses against the University defined in Section A hereof, they must impose the duty and authority of enforcing the policies set forth herein in the principal executive officer of the University-the president. It will be the responsibility of the Board of Regents to furnish all possible assistance to the president when requested by the president.

D. Responsibility of the Office of the Registrar

The Board of Regents recognizes that by the Constitution and Statutes it has the power to make such rules and regulations for the management of the University as it may deem necessary and expedient, not inconsistent with the Constitution and laws of the state. While the Regents fully appreciate their obligations in this respect, they further recognize that in dealing with those offenses against the University defined in Section A hereof, they must impose the duty and authority of enforcing the policies set forth herein in the principal executive officer of the University-the president. It will be the responsibility of the Board of Regents to furnish all possible assistance to the president when requested by the president.

D. Responsibility of the Board of Regents

The Board of Regents recognizes that by the Constitution and Statutes it has the power to make such rules and regulations for the management of the University as it may deem necessary and expedient, not inconsistent with the Constitution and laws of the state. While the Regents fully appreciate their obligations in this respect, they further recognize that in dealing with those offenses against the University defined in Section A hereof, they must impose the duty and authority of enforcing the policies set forth herein in the principal executive officer of the University-the president. It will be the responsibility of the Board of Regents to furnish all possible assistance to the president when requested by the president.

II. Subject to the provisions of Sections I-A through I-D, it shall be the duty of the president to exercise full authority in the regulation of student conduct and in matters of student discipline. In the discharge of this duty, delegation of such authority may be made by the president to administrative or other officers of the institution in such manner and to such extent as may be by the president deemed necessary and expedient; provided, that in the discharge of this duty it shall be the duty of the president to secure to every student the right of due process.

III. The text of this resolution shall be printed in the Student Regulations section of the Student Handbook of the University and in the University Catalog.
# Degrees Offered

Degrees offered are listed alphabetically along with an indication of the college(s) in which they may be earned.

| B | Bachelor's |
| M | Master's   |
| D | Doctorate  |
| S | Specialist |

<table>
<thead>
<tr>
<th>Degree</th>
<th>College(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag</td>
<td>Agriculture</td>
</tr>
<tr>
<td>A&amp;S</td>
<td>Arts and Sciences</td>
</tr>
<tr>
<td>Bus</td>
<td>Business Administration</td>
</tr>
<tr>
<td>Ed</td>
<td>Education</td>
</tr>
<tr>
<td>En</td>
<td>Engineering</td>
</tr>
<tr>
<td>HE</td>
<td>Home Economics</td>
</tr>
<tr>
<td>Gr</td>
<td>Graduate College</td>
</tr>
<tr>
<td>OM</td>
<td>Osteopathic Medicine</td>
</tr>
<tr>
<td>T</td>
<td>Technology</td>
</tr>
<tr>
<td>VM</td>
<td>Veterinary Medicine</td>
</tr>
<tr>
<td>Accounting (B,M)</td>
<td>Bus/Gr</td>
</tr>
<tr>
<td>Aerospace Studies (B)</td>
<td>A&amp;S</td>
</tr>
<tr>
<td>Agricultural Communications (B)</td>
<td>Ag</td>
</tr>
<tr>
<td>Agricultural Economics (B,M,D)</td>
<td>Ag/Gr</td>
</tr>
<tr>
<td>Agricultural Education (B,M,D)</td>
<td>Ag/Gr</td>
</tr>
<tr>
<td>Agricultural Engineering (B,M,D)</td>
<td>En/Gr</td>
</tr>
<tr>
<td>Agriculture (M)</td>
<td>Gr</td>
</tr>
<tr>
<td>Agronomy (B,M)</td>
<td>Ag/Gr</td>
</tr>
<tr>
<td>Crop Science (D)</td>
<td>Gr</td>
</tr>
<tr>
<td>Soil Science (D)</td>
<td>Gr</td>
</tr>
<tr>
<td>Animal Science (B,M)</td>
<td>Ag/Gr</td>
</tr>
<tr>
<td>Animal Breeding (D)</td>
<td>Gr</td>
</tr>
<tr>
<td>Animal Nutrition (D)</td>
<td>Gr</td>
</tr>
<tr>
<td>Dairy Science (M)</td>
<td>Gr</td>
</tr>
<tr>
<td>Poultry Science (M)</td>
<td>Gr</td>
</tr>
<tr>
<td>Applied Behavioral Studies (M,D)</td>
<td>Gr</td>
</tr>
<tr>
<td>Applied Mathematics (M)</td>
<td>Gr</td>
</tr>
<tr>
<td>Architectural Engineering (B,M)</td>
<td>En/Gr</td>
</tr>
<tr>
<td>Architecture (B,M)</td>
<td>En/Gr</td>
</tr>
<tr>
<td>Art (B)</td>
<td>A&amp;S</td>
</tr>
<tr>
<td>Aviation Science (B)</td>
<td>Ed</td>
</tr>
<tr>
<td>Biochemistry (B,M,D)</td>
<td>Ag/A&amp;S/Gr</td>
</tr>
<tr>
<td>Biological Science (B)</td>
<td>A&amp;S</td>
</tr>
<tr>
<td>Botany (B,M,D)</td>
<td>A&amp;S/Gr</td>
</tr>
<tr>
<td>Business Administration (M,D)</td>
<td>Gr</td>
</tr>
<tr>
<td>Chemical Engineering (B,M,D)</td>
<td>En/Gr</td>
</tr>
<tr>
<td>Chemistry (B,M,D)</td>
<td>A&amp;S/Gr</td>
</tr>
<tr>
<td>Civil Engineering (B,M,D)</td>
<td>En/Gr</td>
</tr>
<tr>
<td>Clothing, Textiles and Merchandising (B,M)</td>
<td>HE/Gr</td>
</tr>
<tr>
<td>Computing and Information Science (B,M,D)</td>
<td>A&amp;S/Gr</td>
</tr>
<tr>
<td>Construction Management Technology (B)</td>
<td>T</td>
</tr>
<tr>
<td>Corrections (M)</td>
<td>Gr</td>
</tr>
<tr>
<td>Counseling and Student Personnel (M,D,S)</td>
<td>Gr</td>
</tr>
<tr>
<td>Curriculum and Instruction (M,D,S)</td>
<td>Gr</td>
</tr>
<tr>
<td>Distributive Education (M)</td>
<td>Gr</td>
</tr>
<tr>
<td>Economics (B,M,D)</td>
<td>A&amp;S/Bus/Gr</td>
</tr>
<tr>
<td>Education</td>
<td>Elementary Education (B) Ed</td>
</tr>
<tr>
<td></td>
<td>Secondary Education (B) Ed</td>
</tr>
<tr>
<td></td>
<td>Special Education (B) Ed</td>
</tr>
<tr>
<td>Educational Administration (M,D,S)</td>
<td>Gr</td>
</tr>
<tr>
<td>Electrical Engineering (B,M,D)</td>
<td>En/Gr</td>
</tr>
<tr>
<td>Electronics Technology (B)</td>
<td>T</td>
</tr>
<tr>
<td>English (B,M,D)</td>
<td>A&amp;S/Gr</td>
</tr>
<tr>
<td>Entomology (B,M,D)</td>
<td>Ag/Gr</td>
</tr>
<tr>
<td>Environmental Engineering (M)</td>
<td>Gr</td>
</tr>
<tr>
<td>Environmental Science (M,D)</td>
<td>Gr</td>
</tr>
</tbody>
</table>

Family Relations and Child Development (B,M) | HE/Gr |
Finance (B) | Bus |
Fire Protection and Safety Technology (B) | T |
Food, Nutrition and Institution Administration (B,M) | HE/Gr |
Food Science (M,D) | Gr |
Foreign Language | |
French (B) | A&S |
German (B) | A&S |
Russian Language and Literature (B) | A&S |
Spanish (B) | A&S |
Forest Resources (M) | Gr |
Forestry (B) | Ag |
General Agriculture (B) | Ag |
General Business (B) | Bus |
General Engineering (B,M,D) | En/Gr |
General Technology (B) | T |
Geography (B,M) | A&S/Gr |
Geology (B,M) | A&S/Gr |
Health (B) | A&S |
Health, Physical Education and Recreation (M) | Gr |
Higher Education (M,D,S) | Gr |
History (B,M,D) | A&S/Gr |
Home Economics (D) | Gr |
Home Economics Education and Community Services (B,M,D) | HE/Gr |
Horticulture (M) | Gr |
Horticulture and Landscape Architecture (B) | Ag |
Hotel and Restaurant Administration (B) | HE |
Housing, Interior Design and Consumer Studies (B,M) | HE/Gr |
Industrial Arts Education (M) | Gr |
Industrial Technology Education (B) | Ed |
Industrial Engineering and Management (B,M,D) | En/Gr |
Journalism and Broadcasting (B) | A&S |
Leisure (B) | A&S |
Management (B) | Bus |
Management Information Systems (B) | Bus |
Management Science and Computer Systems (B) | Bus |
Manufacturing Systems Engineering (M) | Gr |
Manufacturing Technology (B) | T |
Marketing (B) | Bus |
Mathematics (B,M,D) | A&S/Gr |
Mechanical Engineering (B,M,D) | En/Gr |
Mechanical Design Technology (B) | T |
Mechanical Power Technology (B) | T |
Mechanized Agriculture (B) | Ag |
Medical Technology (B) | A&S |
Microbiology (B,M,D) | A&S/Gr |
Military Science (B) | A&S |
Music (B) | A&S |
Music Education (B) | A&S |
Natural Science (M) | Gr |
Nuclear Engineering (M) | Gr |
Occupational and Adult Education (M,D,S) | Gr |
Osteopathic Medicine (DO) | OM |
Petroleum Technology (B) | T |
Philosophy (B,M) | A&S/Gr |
Physical Education (B) | A&S |
Physics (B,M,D) | A&S/Gr |
Physiological Science (M,D) | Gr |
Physiology (B) | A&S |
Plant Pathology (M,D) | Gr |
Political Science (B,M) | A&S/Gr |
Pre-veterinary Science (B) | Ag |
Psychology (B,M,D) | A&S/Gr |
Radio-Television-Film (B) | A&S |

Summary of degrees offered:

- Bachelor's: 89
- Master's: 70
- Doctor's: 46
- Specialist: 5
College of Agriculture

Charles B. Browning, Ph.D., Dean
Paul D. Hummer, Ph.D., Associate Dean for Resident Instruction
C. Wesley Holley, Ed.D., Assistant Dean for Resident Instruction
Clement R. Henderson, M.A., Director of Student Academic Services

Modern agriculture is the nation's largest industry employing approximately one-fourth of the nation's total workforce. The Dictionary of Occupational Titles lists more than 500 different types of positions in the profession of agriculture. These positions include work in research, education, business, industry, government and international development as well as farming and ranching.

The curricula in the College of Agriculture are designed to meet the needs of students in a wide range of subject matter related to food and fiber production and associated agribusinesses and organizations. Courses of study are concerned with personal development as well as professional competence of students in their chosen fields.

Both general education and professional courses are available in 13 major fields of study. Plans of study that emphasize production, science, business or other specific areas of specialization are provided in the various departments.

Academic Programs

Undergraduate Programs. The Bachelor of Science in Agriculture degree is offered in the following major fields of study: agricultural communications, agricultural economics, agricultural education, agronomy, animal science, biochemistry, entomology, forestry, general agriculture, horticulture, mechanized agriculture and pre-veterinary science. The Bachelor of Landscape Architecture is also offered in the College of Agriculture.

Graduate Programs. Graduate study is available in all departments in the College. In addition to the Master of Agriculture and Master of Science degrees which may be obtained through several departments, the Doctor of Philosophy degree (Ph.D.) may be earned in the following areas: agricultural economics, agricultural education (Ed.D.), agricultural engineering, animal breeding, animal nutrition, biochemistry, entomology, crop science, food science, plant pathology, and soil science.

High School Preparation and Admission Requirements

The high school preparation and admission requirements for the College of Agriculture are the same as the general University requirements. A solid background in English, natural science, and algebra is important preparation for the many academic programs in the various agricultural disciplines.

Transfer Students

Students who transfer from an accredited college or junior college must meet the general University admission requirements. All transferred courses are recorded on the OSU transcript; however, transfer students from a junior college must complete at least one-half of the total credit hours required for graduation in a given curriculum at this institution. Specific departmental requirements needed for graduation are determined by the department in which the student plans to earn his or her degree.

Scholarships

Students enrolled and entering the College of Agriculture are annually awarded more than $185,000 in scholarships from the College and its departments. The following areas will be considered in the awarding of scholarships: financial need; scholastic standing in high school or college; leadership qualities which have been shown in school, church, community or youth groups; sincere interest in agriculture.

Applications and additional information may be obtained from the Dean's Office, College of Agriculture, Oklahoma State University, 136 Agricultural Hall, Stillwater, OK 74078. Applications are available beginning December 15.

Academic Advising

All students in the College of Agriculture have the advantage of being advised by a faculty member working in the individual student's academic discipline. Such advisers are readily available to students and work closely with the students throughout their academic careers.

Special Academic Programs

Honors Program. The Honors Program in the College of Agriculture is designed to provide outstanding students with opportunities to pursue new challenges and academic excellence. Honors courses, seminars, and special honors contracts provide for discussions and independent thought by students who have the desire and ability to explore academic subjects beyond the normal class work material.

Honors awards available in the College of Agriculture are:

1. General Education Honors
2. Departmental Honors
3. The bachelor's degree, with honors

Awards (1) and (2) may each be earned independently of the others. Award (3) is earned by satisfying the requirements of both (1) and (2). The completion of each award is noted on the student's transcript. Students who complete all three receive the bachelor's degree with honors diploma.

All entering freshmen who have ACT composite scores of 27 or above are eligible to become part of the Honors Program. All other students who have an overall college-level grade-point average of 3.50 or above may enroll in the Honors Program.

Additional information may be obtained from the director of the Agriculture Honors Program, 136 Agricultural Hall.

Pre-veterinary Medicine Curriculum. The program in pre-veterinary medicine as offered in the College of Agriculture includes all courses required for admission to the College of Veterinary Medicine.

A minimum grade-point average of 2.80 is required in the courses listed below:

- English composition and technical writing (8 hours minimum): ENGL 1113 and 1323; ENGL 2333 (or 3323).
- Chemistry (17 hours minimum): CHEM 1314 and 1515 (or 1215 and 1225).
- Organic chemistry (5 hours minimum): CHEM 3015 (or 3053, 3153, and 3112).
- Biochemistry (4 hours minimum): BIOCH 3653 and 3721.
- Physics (8 hours minimum): PHYS 1114 and 1214.
- Mathematics (3 hours minimum): MATH 1513 (or 1613 or 1715 or other advanced mathematics).
Agricultural Communications

Associate Professor and Head Kevin G. Hayes, M.A.

The modern agricultural complex of production and industry is so diverse and specialized that communication between the segments, as well as with the general public, is vital to the function of the whole. Education in agriculture and journalism to effectively provide such communication is the curriculum objective of the agricultural communications and journalism program.

Students may develop strong emphasis in special-interest areas such as advertising, radio and television work, feature or news writing and reporting, or research report writing, as well as develop a double-major program of study with specific departments of the College of Agriculture.

Career opportunities are excellent in all areas of modern agriculture for the graduate with a Bachelor of Science degree in Agriculture with a major in agricultural communications.
Courses in economic theory, econometrics, mathematical economics, statistics, and computer science are an integral part of the program. Problems of agricultural policy, natural resource use and rural area development and planning are also important topics. The faculty gives direction and individual guidance to student research in marketing, production, management of agricultural enterprises, price analysis, land and water use and development, rural development and planning, agricultural finance, international trade, farm appraisal and agricultural policy. Specialization is achieved through course electives and research topics. Each student is guided in the preparation of the program of study by an advisory committee to assure that background or prerequisite work and the graduate plan will lead to the desired depth and breadth of proficiency.

Admission Requirements. Prerequisites to advanced training in economic problems faced by agriculture and rural society, and (2) the desire and ability to learn methods of rigorous logical analysis. In addition, a three-semester program of study is designed to provide the student with a broad depth and breadth of proficiency.

The program of studies offered by the Department of Agricultural Education as a member of the Administrative Board is not required prior to official admittance to the departmental graduate program.

Agricultural Education
Professor and Head H. Robert Terry, Ph.D.

The program of studies offered by the Department of Agricultural Education is designed to provide both comprehensive and specialized training in preparation for a career as an educator in the various fields of agriculture. In addition to the objective of preparation for licensure as teachers, graduates are professionally prepared for work in cooperative extension and other federal and state programs and services, as well as international education endeavors. Graduates also may find employment as educational directors and consultants with agribusinesses, industrial firms, and organizations. Programs of study are designed for persons desiring to serve at secondary, post-secondary and adult education levels. Studies may culminate in the B.S., M.Ag., M.S. or Ed.D. degrees.

The undergraduate teaching option is designed primarily to qualify the bachelor's degree recipient for the Oklahoma Vocational Agriculture Teaching License. This license is recognized as meeting requirements for initial employment as a teacher in most other states. The professional service option is designed to focus on careers relating to education and service in agriculture, but outside of the public school setting. The primary emphasis is upon employment in cooperative extension or closely allied areas. Some students find it advantageous to elect a dual major, thus meeting requirements in both agricultural education and another major within the College of Agriculture. The undergraduate programs in agricultural education are structured to provide educational experience in general education, specialized or technical agriculture and professional education.

Graduate Programs
Graduate programs in the Department of Agricultural Education are designed to (1) prepare students for entry into or advancement in teaching careers and (2) provide for further development of professional leadership skills in other educational careers in agriculture, agribusiness, government service, extension, adult education, and vocational-technical programs. An attempt is made to develop individual study programs to meet needs of both international and domestic students.

Advanced graduate studies are more specifically directed toward preparing graduates for careers in teacher education, administration, supervision, curriculum development and other areas of professional leadership in agriculture, agricultural extension or vocational education.

Candidates for the degree of Master of Science must complete a minimum of 21 semester credit hours of 5000-level courses or above. A total of 16 hours must be in education; 12 hours must be in agricultural education completed at this institution. At least ten hours must be completed in a minor area of specialization such as technical agriculture, education, or youth development. Other courses completed within the total 30 credit hours required may be chosen as free electives. Applicants must meet normally the requirements for the degree.

An alternative is the Master of Science degree are required to complete a course in research design and a thesis as a part of the requirements for the degree.

The Master of Science degree is a four-year program leading to the Bachelor of Science degree in Agriculture. This curriculum is designed to provide the student with a broad general education in the social, biological and physical sciences, and mathematics. Degree candidates will receive technical training in specialized fields of greatest interest to them.

Graduates in agricultural mechanization are employed by farm machinery companies, building material suppliers, irrigation equipment companies, manufacturers of materials-handling equipment, manufacturers of processing equipment, pump companies, power companies, or cooperatives, and government agencies such as the Farmers' Home Administration and the Federal Land Bank.
A degree with a major in agricultural mechanization requires 130 credit hours. Course work is distributed approximately as follows: basic science and mathematics-20%; applied science and engineering-35%; business-20%, social science and communications-25%.

Agricultural Engineering Degree

Agricultural engineers are professional people who generate and adapt engineering knowledge and technologies for the efficient and effective production, processing, storage, handling and distribution of agricultural, food and other biological products, and the management of natural resources.

Students interested in a degree in agricultural engineering may initially enroll in the College of Engineering, Architecture and Technology. If they elect to enroll in the College of Agriculture, they should request an agricultural engineering adviser, and transfer to the College of Agriculture, if they elect to enroll in the agricultural engineering program at the College of Agriculture.

Agricultural engineering students study engineering, physical, mathematical, biological and agricultural sciences. Agricultural engineering courses apply mathematical, basic sciences and knowledge to create and design new systems and equipment for agricultural and biological production and processing. Social studies and humanities prepare students to work with people; these studies are important because the agricultural engineer early in his or her career assumes supervisory and management responsibilities. Computer use is emphasized for simulation, control, analysis and design.

Agricultural engineering courses for juniors and seniors integrate the engineering sciences with agricultural and biological sciences and teach students to design solutions to real problems of society. Students work both as individuals and in teams to solve design problems provided by industrial firms who also hire agricultural engineering graduates.

Students receive specialized design experiences in one or more of the following areas: hydrology and water resources, including flood control, irrigation, and water supply; machinery, instruments and controls for farming and ranching, food processing and packaging, and production of biotechnology products; and systems for efficient production, processing, handling and storage of agricultural and biological products.

A wide variety of employment opportunities are available for agricultural engineers in industry and public service. Some of these opportunities include governmental agencies; irrigation and drainage companies; tractor and machinery manufacturers; manufacturers of agricultural chemicals; producers of steel, building and construction supplies; electric power companies; food processing and canning; and feed processing companies.

Developments in related engineering disciplines are making new job opportunities available in the fields of food engineering, agricultural engineering, farm power and machinery, design structures and process engineering. The agricultural engineering program is accredited at the basic level by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Graduate Programs

The School of Agricultural Engineering offers three programs leading to post-baccalaureate degrees: Master of Agricultural Engineering, Master of Science and Doctor of Philosophy. The Master of Agricultural Engineering program places emphasis on design and internship in engineering experience to prepare the graduate for practice in the engineering profession.

Graduate students prepare designs and specifications for special equipment and facilities. They are expected to demonstrate by thesis and supporting research or by design the ability to organize a design problem or an experimental investigation, carry it to completion and report the results.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from an engineering curriculum accredited by the Accreditation Board for Engineering and Technology. Admission to the Master of Agricultural Engineering degree program is permitted for students who meet the prerequisites as stated in the "Master of Engineering" section of the College of Engineering, Architecture and Technology. The departmental graduate committee will evaluate the applicant's credentials to determine equivalency and specify requirements to overcome deficiencies. A student must be accepted by an adviser in the Department prior to official admission to the graduate program.

Degree Requirements. A candidate for any of the degrees listed above follows an approved plan of study which must satisfy at least the minimum University requirements for that particular degree.

Agriculture (General)

Professor and Associate Dean Paul D. Hummer, Ph.D.

The general agriculture program of study is designed to provide students the opportunity of obtaining a broad education in agriculture rather than the more specialized study typical of departmental programs. Students select general agriculture as their major for one of two reasons:

1. Students undecided on a major may elect to take the general agriculture program as it provides the opportunity to investigate various majors and options. Courses taken in the general agriculture option apply to the B.S. degree programs in Agriculture, as well as degree programs in some other colleges. Transfers from one major to another may be made at any time. Career information and guidance is available from faculty advisers as well as the Agricultural Career Development Office, 136 Agricultural Hall.

2. Students wanting a broad-based degree program may do so through the general agriculture program. This option allows students to prepare for careers that require a broad background of understanding of the modern agricultural complex.

The general agriculture curriculum may be pursued in any department in the college and allows students to select courses of special interest to them in relation to the work they plan to do. Basic courses in general education, the sciences and business are required along with over 40 credit hours of electives, in order to complete requirements for a Bachelor of Science degree in Agriculture.

Graduate Programs

The Master of Agriculture degree is designed for students interested in graduate professional training with a strongly applied research orientation. The degree is offered in the following areas of emphasis: agricultural economics, agricultural education, agronomy, animal science, entomology, forestry, horticulture and landscape architecture, and plant pathology.

Purpose. The purpose of this degree is to provide a program which will give additional specialization in technical fields as well as increased breadth of training. Students who are interested in working toward the Ph.D. degree should follow the regular Master of Science degree program.

Character of Program. This program will provide a greater breadth of study than the Master of Science program. Emphasis will be given to practical application of the technical aspects of the dis-
Agronomy

Professor and Head Charles J. Scifres, Ph.D.

Agronomy is the science of soil management and the production of field crops and forages. Undergraduate options include biotechnology, business, crop science, plant protection, range management, and soil science. Each of these options provides a thorough preparation in the sciences relating to its specialization.

Modern agricultural production requires a highly technical approach to problems such as soil and water conservation, crop and range improvement and management, prevention and abatement of agricultural sources of environmental pollution, and judicious use of agricultural chemicals. In the vast field of agribusiness, technical preparation in agronomy is essential in supplying agricultural producers with up-to-date information, as well as improved seed, fertilizers, management systems and pesticides. Processing, distribution and marketing of food, fiber and feed crops require an integration of production technology with economics at all levels. Agronomists are in demand for research and marketing positions in universities, industry and government. Concern for future food supplies creates an urgency for technological advancement in food production which cannot be ignored.

Each of the areas of study is designed to permit students of varying backgrounds and experiences to attain a level of preparation commensurate with their capabilities and motivation. There are no specific prerequisites.

Careers in agronomy include farm or ranch operation or management; land appraisal for banks or loan companies and crop consulting; technical sales and service for seed, fertilizer or agricultural chemical supply companies; federal employment in soil and range conservation; research positions as plant breeders, fertilizer chemists and weed control specialists with federal or state experiment stations or private industries; teaching and extension positions with colleges and universities; and a broad range of employment or ownership in retail businesses supplying feed, seed, grain, fertilizers, agricultural chemicals and other agricultural supplies and services.

Study for the B.S. degree, in addition to a standard agronomic academic program, provides a thorough grounding in the biological and physical sciences, and communications, with sufficient elective hours to permit flexibility.

Graduate Programs

The Department of Agronomy offers programs of course work and research leading to the Master of Agriculture in the emphasis area of agronomy, and Master of Science degrees in agronomy, and the Doctor of Philosophy degree with majors in crop science or in soil science. Programs are available in the areas of plant breeding and molecular genetics, cyto genetics, range management, forage management, weed science, crop physiology, soil morphology and genesis, soil microbiology, soil fertility and management, soil physics, soil-water management, and soil chemistry. Applicants should indicate their specific area of interest upon application.

The degree plans of the Department of Agronomy prepare individuals for successful careers in a variety of areas including farming and ranching, extension education, agricultural business, and plant or soil science research and teaching.

Prerequisites. Admission to the graduate program requires a B.S. degree in agronomy or in a closely related field. Applicants should have completed basic courses in agronomy, biology, chemistry and mathematics, required of undergraduate majors. Deficiencies in fundamental course requirements will be met by the student with the direction of the student's advisory committee. Applicants must be accepted by an adviser in the Department prior to official admission.

Degree Requirements. Students must follow approved plans of study which meet the minimum requirements for the respective degrees they are pursuing.

The Master of Science degree in agronomy may be earned by utilizing one of two plans:

Plan I-Thesis, minimum of 36 credit hours of course work, including six credit hours of AGRON 5000, master's thesis.

Plan II-Formal report (non-thesis), minimum of 32 credit hours of course work, including two credit hours of AGRON 5000, master's thesis.

The Master of Agriculture degree may be earned by utilizing one of three options:

Option A-Formal report (non-thesis), minimum of 32 credit hours of course work, including two credit hours of AGRON 5000, master's thesis.

Option B-Minimum of 36 credit hours of course work which includes six hours of credit (AGRON 5230, Research) for a professional internship and a creative component.

Option C-Minimum of 36 credit hours of course work which includes six hours of credit (AGRON 5230, Research) for a professional internship and a creative component.

The Doctor of Philosophy degree in crop science or soil science are developed individually for each candidate. In general they must include 10 credit hours of agronomy courses at the 5000 level or above (excluding thesis), and meet certain requirements in basic disciplines such as statistics, mathematics, botany, and chemistry. Study of a foreign language is not required but can be incorporated if the student and advisory committee feel that it is desirable.
Animal Science

Professor and Head Robert Totusek, Ph.D.

The Department of Animal Science offers professional training at both the undergraduate and graduate levels. The undergraduate program leads to the Bachelor of Science in Agriculture degree. Graduate studies culminate in the Master of Science, Master of Agriculture (emphasis in animal science) or the Doctor of Philosophy in nutrition, animal breeding, animal reproduction or food science.

Animal science is concerned with the science, art and business of the production of beef cattle, dairy cattle, horses, poultry, sheep and swine. An animal scientist is concerned with the application of the principles of the biological, physical and social sciences to the problems associated with livestock production and management.

Animal science is also concerned with the products of food animals: meat, dairy foods and eggs. The food industry is one of the largest and most important industries in the United States. Students can gain expertise in the processing, quality control and marketing of meat, dairy and poultry products.

Undergraduate students may elect an option in the areas of animal biotechnology, business, food industry, food science, livestock merchandising, pre-veterinary animal science, production, ranch operations or a double major with agricultural education. In addition, students have the opportunity to concentrate their studies on one of these animal groups (meat animals, dairy, horses or poultry). Internship programs providing three to six months of off-campus work experience are available in all options. Participation in undergraduate clubs (Block & Bridle, Dairy Science or Food Industry clubs) or judging teams (livestock, meats, horses, dairy cattle, dairy foods or poultry) improves social, communication and leadership skills.

Students interested in veterinary medicine may complete the pre-veterinary medicine requirements at the same time they are working toward a B.S. degree in animal science. In addition, pre-vet students gain valuable insight into the care and management of animals throughout the animal science curriculum.

Undergraduate students follow a similar curriculum during the first two years which includes basic courses in the physical, biological and social sciences, and a series of basic courses in agriculture and business. Upper-class students take a basic core of advanced science courses including genetics, physiology and nutrition. As seniors, students complete a series of advanced animal science courses which are designed to apply knowledge of business, science and livestock management to livestock or food production systems. Every opportunity is taken in teaching to utilize the excellent herds, flocks and processing facilities owned or operated by the Department.

Students completing a degree with a major in animal science have a wide choice of challenging careers including ownership or management of farms, ranches, feedlots or state and federal agencies concerned with inspection, grading or regulation; sales and service positions with agricultural extension or teaching; and work in the processing, distributing and merchandising of dairy, poultry and meat products. Students who earn the masters or doctorate can look forward to careers in teaching, research or extension with universities, the U.S. Department of Agriculture or private industry.

Graduate Programs

The Department of Animal Science offers graduate work leading to the Master of Science degree in animal science, dairy science, poultry science, and food science. Research work at the M.S. level is available in the areas of animal breeding (genetics), animal nutrition, animal physiology or food science (meat or milk products). A Master of Agriculture degree in the emphasis area of animal science is also available. The Department offers programs leading to the Doctor of Philosophy degree in animal breeding, animal nutrition and food science.

Prerequisites. Admission to the graduate program requires an undergraduate major in animal science, dairy science or poultry science, or in closely-related biological sciences or biochemistry. In addition, students with a major in dairy manufacturing, microbiology, human nutrition, food science, or food technology can qualify for the program in food science. A student enrolling in a degree program must have been accepted by an adviser prior to official admission. In all cases, the student's graduate adviser or committee may recognize specific undergraduate deficiencies and require their removal.

Biochemistry

Professor and Head Roger E. Koepp, Ph.D.

Biochemistry, the central scientific discipline linking the chemical, physical and biological sciences, exerts a profound influence on the progress of medicine and agriculture. By applying concepts and methods of chemistry and physics to the fundamental problems of biology, biochemists have made great progress in their effort to understand the chemistry of living organisms.

Biochemists are concerned with living things. They must acquire some knowledge of the biological sciences. Since a biochemist's tools are the physical sciences, he or she must receive sound training in mathematics, physics and chemistry.

Challenging positions for well-trained biochemists are available in colleges and universities, state and federal laboratories, research institutes, medical centers and in an increasing number of industrial organizations, particularly the pharmaceutical and food industries. Biochemists are involved with research on the chemistry of processes occurring in plants, animals, and various microorganisms, and with the discovery and development of antibiotics, vitamins, hormones, enzymes, insecticides and molecular genetic techniques.

At the graduate level a major in biochemistry administered by the Department of Biochemistry is available through either the College of Agriculture or the College of Arts and Sciences. An honors program is available. The curriculum provides a broad background in chemistry and biological science and permits flexibility in meeting particular interests of the student. Courses in biochemistry are based on general, organic and analytical chemistry. The biochemistry curriculum provides students with sufficient training in the basic sciences of mathematics, physics, chemistry and biology to meet the needs for graduate study in most fields of modern science related to agriculture or medicine. The curriculum is excellent for preprofessional students of medicine, dentistry and veterinary medicine.

Graduate Programs

Because many of the opportunities in biochemistry require advanced training, a major part of the program in the Department of Biochemistry is concerned with its graduate program leading to the M.S. or Ph.D. degree. This graduate program is an integral part of extensive basic research activities conducted in some animal groups (meat animals, dairy, horses, poultry). Internship programs providing three to six months of off-campus work experience are available in all options. Participation in undergraduate clubs (Block & Bridle, Dairy Science or Food Industry clubs) or judging teams (livestock, meats, horses, dairy cattle, dairy foods or poultry) improves social, communication and leadership skills.

Students interested in veterinary medicine may complete the pre-veterinary medicine requirements at the same time they are working toward a B.S. degree in animal science. In addition, pre-vet students gain valuable insight into the care and management of animals throughout the animal science curriculum.

Undergraduate students follow a similar curriculum during the first two years which includes basic courses in the physical, biological and social sciences, and a series of basic courses in agriculture and business. Upper-class students take a basic core of advanced science courses including genetics, physiology and nutrition. As seniors, students complete a series of advanced animal science courses which are designed to apply knowledge of business, science and livestock management to livestock or food production systems. Every opportunity is taken in teaching to utilize the excellent herds, flocks and processing facilities owned or operated by the Department.

Students completing a degree with a major in animal science have a wide choice of challenging careers including ownership or management of farms, ranches, feedlots or state and federal agencies concerned with inspection, grading or regulation; sales and service positions with agricultural extension or teaching; and work in the processing, distributing and merchandising of dairy, poultry and meat products. Students who earn the masters or doctorate can look forward...
includes all the courses listed for the M.S. degree, at least four of the advanced graduate courses in biochemistry (6000 level) and two offerings of Special Topics (6820). Additional course requirements, appropriate to the student’s interests, are determined by the advisory committee. The advisory committee is selected at the end of the second semester. Each student will take a series of cumulative examinations beginning in January of his or her first year. A more comprehensive qualifying examination is given, usually at the end of the fourth semester of graduate study.

One year of a foreign language at the college level is required. The student must present, and defend in a final oral examination, an acceptable four-semester of graduate study. Each student will take a series of cumulative examinations, beginning in January of his or her first year. A more comprehensive qualifying examination is given, usually at the end of the fourth semester of graduate study.

One year of a foreign language at the college level is required. The student must present, and defend in a final oral examination, an acceptable fourth semester of graduate study. Each student will take a series of cumulative examinations beginning in January of his or her first year. A more comprehensive qualifying examination is given, usually at the end of the fourth semester of graduate study.

Entomology
Professor and Interim Head Russell E. Wright, Ph.D.

Entomology is the science and study of insects and related organisms regarding their biology, structure, identification, physiology, economic significance, and population manipulation.

Education in entomology prepares the student for a career in industry, public service with state or federal agencies, or self-employment. A background in the basic physical and biological sciences is required before specialization in entomology can be initiated. The entomologist is qualified for a wide range of activities including research, teaching, quarantine and enforcement, insect control with insecticides or biological control agents, agriculture, pest control, insecticide sales or distribution, military entomology and pest management consulting.

Graduate Programs

The Department offers programs of study and research leading to the degrees of Master of Science and Doctor of Philosophy.

Prerequisites. Students making applications must be accepted by an adviser and approved by the departmental graduate committee prior to being admitted to the Graduate College.

Each program of study will be under the direction of a graduate committee. The program will be adapted to the individual’s needs but will comply with all departmental and Graduate College requirements. The thesis option for the M.S. requires a minimum of 30 credit hours while the report option has a minimum of 36 credit hours. An oral examination is required of all candidates. Graduate student candidates are required to meet with their advisory committee every six months for program reports and/or examinations. Doctoral candidates are required to present a public defense of their dissertations. Doctoral students must assist in teaching one or more laboratories, including "Introduction to Entomology", for at least one semester. Students supported as half-time research assistants are required to work a minimum of twenty hours per week on projects of their major professors.

Forestry
Associate Professor and Head Edwin L. Miller, Ph.D.

America’s forests are an important natural renewable resource. With proper decisions concerning management, forests can provide a bounty of uses and values for generations to come. Professional foresters play a vital role in developing and utilizing the forest and its diverse resources: timber, water, wildlife, range forage, recreation and wilderness.

Professional foresters manage the planting, growth, and harvest of trees, while at the same time protecting forests from the harmful effects of fire, disease and insects. Foresters today are problem solvers using a blend of science, technology, economics and sociology to produce the products of the forest desired by society. Foresters work with private landowners and city planners, they teach and conduct research at universities, they administer parks and recreation areas, they manage the business of forest industry, and they manage the public forest land.

Graduates with a Bachelor of Science degree may be employed by federal agencies, including the U.S. Forest Service, Bureau of Land Management, the Soil Conservation Service, the Fish and Wildlife Service, and the Bureau of Indian Affairs. In addition, state, county and municipal governments employ foresters in a variety of positions. Wood-using industries retain foresters for land management, land and timber acquisition and harvesting positions as well as in mill production and administrative work. Foresters work for associations promoting the use of forest products and in many other public relations jobs. Some foresters are self-employed as consultants, specializing in timber and land appraisals, management planning, and a variety of special services. Recipients of advanced degrees, especially the doctorate, may conduct research for the federal or state governments, universities or industrial organizations, or may enter the teaching profession.

The Department of Forestry offers a major in forestry leading to a Bachelor of Science degree in Agriculture. Course work in forest management is offered for the individual with career aspirations in the U.S. Forest Service and other federal agencies, state and local forestry organizations, forest industry and consulting. Courses in forest products are designed for those interested in the business, manufacturing and sales aspects of forestry. For the student with a research career in mind, course work in forest science is available. Requirements for a B.S. degree include the successful completion of a nine-week summer camp and a total of 140 credit hours of course work. The summer camp is scheduled to follow the sophomore year and is held annually in different forest settings. Past summer camps have been held across the U.S. from Maine to Oregon, from Montana to Florida, and even in Brazil. Students learn field forestry skills and observe state-of-the-art operations.

The Department of Forestry maintains two research stations in southeastern Oklahoma in the midst of the Ouachita National Forest and industrial timber holdings. Oklahoma has an active and progressive forest industry with one of the most modern highly mechanized timber harvesting systems in the world. One of the largest paper mills in the southern United States is located in the pine-oak forests of southeastern Oklahoma. Field trips to this area comprise part of the instruction in many forestry courses.

Graduate Programs

The Department of Forestry offers instruction leading to Master of Science degrees in forest resources and environmental science for students interested in graduate training with a research orientation. The Master of Agriculture degree in the emphasis area of forestry is offered for students interested in non-research graduate training in forestry. Programs of instruction and research leading to a Doctor of Philosophy degree are available through cooperating departments with an adviser from the Department of Forestry.

Instructional programs are designed to serve the needs of individual students and allow concentration in the areas of: forestry, ecology, physiology, economics, genetics and tree improvement, silviculture, management, and watershed management. The prerequisite for graduate study in the Department of Forestry is a bachelor’s degree in forestry or a related field with an overall undergraduate grade-point aver-
age of 3.00 ("B" average). Applicants for financial aid are required to submit scores from the Graduate Record Examination for full consideration. Students without a bachelor's degree in forestry must take an approved core of undergraduate forestry courses for the Master of Science in forest resources and the Master of Agriculture degree.

Students preparing for the Master of Science in forest resources are required to complete 30 credit hours of course work including six hours of "Research and Thesis" (FOR 5000) (Plan I). Students preparing for the Master of Agriculture degree may elect to meet the requirements of either Plan I or Plan II (see "Credit Requirements" section of the "Graduate College.").

A student must be accepted by an adviser on the Graduate Faculty in the department prior to official admission to the program.

Horticulture and Landscape Architecture

Professor and Head Dale M. Maroneck, Ph.D.

Horticulture is the science and art associated with the culture and production of flowers, trees, shrubs, turfgrass, vegetables, fruits and nuts. It also includes the proper use and maintenance of plants in the landscape. Thus, horticulture is involved with the production of a significant part of the food supply and provides a major source of the beauty in and around homes, cities, parks, highways, golf courses and other public areas.

Today, horticulture requires highly trained and capable people to help meet the food demands of society and to be involved in activities that lead to a better quality of life.

Studies in horticulture cover a wide variety of plants and subjects. Factors such as nutrition, irrigation, genetics, propagation, control of flowering and fruit and seed production are considered in their relationship to culture, production, harvesting and storage. Students can prepare themselves for careers in public grounds administration, horticulture business, production, teaching, extension and research.

The training that the student obtains is related to the specific area of emphasis that is chosen. Regardless of one's interest, objectives, or area of emphasis, a good knowledge and understanding of horticulture is a necessity. A student can receive a Bachelor of Science (B.S.) degree and choose from the two following options:

Horticulture provides the training and expertise for production of fruits, nuts, vegetables, nursery crops, flower crops, etc. Training can be general, have a business or science orientation, or be chosen to emphasize a particular commodity area of horticulture;

Turf management provides the training for turfgrass production and for management of turfgrasses in golf courses, in parks, home landscapes, along highways, etc. After the B.S. degree is completed, a qualified student may choose to pursue a graduate degree, specializing in any option.

Landscape architecture is the art of design, planning or management of the land and arrangement of natural and man-made elements thereon through application of cultural and scientific knowledge. It is also concerned with resource conservation and stewardship to the end that the resultant environment serves a useful and enjoyable purpose.

There are two options in the landscape area:

Landscape architecture is the study of art, business, construction, design, ecology, engineering and horticulture in a five-year professional program leading to the Bachelor of Landscape Architecture (B.L.A.) degree. Typical employers include landscape architecture firms, architectural-engineering firms and governmental agencies dealing with land planning, urban planning and design, or parks and recreation.

In an effort to maintain an effective balance between students, faculty, and facilities, enrollment in the fourth and fifth years of the program is limited to 25 students each. Students will be evaluated during their third year by the faculty to select the most qualified candidates based upon academic achievement and professional potential. Minimum requirements may vary each year; however, a student must have completed a minimum of 60 credit hours with "C" average or above in all courses required as prerequisites to the last two years of the B.L.A. program.

Landscape contracting is a four-year study leading to the Bachelor of Science in Agriculture degree. It emphasizes the implementation and management phases of landscape development.

Course work includes basic landscape architectural design, construction technology, business and horticulture. Graduates are employed by landscape nurseries, contracting companies, design/building firms and landscape maintenance companies.

Graduate Programs

The Department offers work leading to a Master of Science degree and a Master of Agriculture degree in an emphasis area of crop science. It is desirable that applicants have a strong background in biological or agricultural sciences. All requirements of the Graduate College must be satisfied by each applicant. In addition, applicants for graduate programs in plant pathology are required to take the Graduate Record Examination and to submit their scores with their applications and transcripts. Approval for admittance will be determined by the departmental screening committee and the department head. During the first semester of enrollment, each student, after council with the department head, will select a faculty adviser. Each graduate program is under the direction of the major adviser and a selected faculty committee and is adapted to the needs of the graduate student. There is no graduate credit for courses below the 4000 level. Each student will follow a program of study and research approved by his or her committee and, except for the Master of Agriculture degree, must submit an approved thesis.

Plant Pathology

Professor and Head Larry J. Littlefield, Ph.D.

Plant pathology is a broad discipline that ranges from basic studies of physiological and genetic aspects of plant diseases to the development of practical plant disease controls. It encompasses the science required to understand the causes of plant diseases as well as the art of preventing or controlling these diseases. Thus, the plant pathologist must have knowledge of plant biology as well as practical plant culture. Plant pathology, as a discipline, is actively involved in the newly emerging field of biotechnology.

Graduates in plant pathology (Ph.D.-level individuals) commonly find employment as research scientists in universities, the government (U.S. Department of Agriculture), industry or with various international development agencies. Graduates with the M.S. degree often work as research technicians in industries, universities or government laboratories or as sales or technical representatives in the agrichemical or plant breeding industries.

To qualify for graduate study in plant pathology an undergraduate student should obtain a solid background in the basic sciences, especially biology and chemistry, math, English and communication skills.

In order to become a fully trained plant pathologist, one or more graduate degrees in plant pathology are required. The Department offers both M.S. and Ph.D. programs with opportunities to specialize in a wide range of basic or applied research fields.

Graduate Programs

The Department offers programs of study and research leading to the Master of Science, Master of Agriculture in the emphasis area of plant pathology, and Doctor of Philosophy degrees. Programs are concerned with the cause, development, and control of plant diseases. Research problems are involved with on-going projects in the Oklahoma Agricultural Experiment Station, which include investigations on disease control (chemical, cultural, biological, and genetic) soil-borne diseases, virology, phytopathology, nematology, genetics, and host-parasite physiology. Individual programs can be developed toward basic research or can be developed to provide a broad practical background in plant health and pest management.

Admission Requirements. It is desirable that applicants have a strong background in biological or agricultural sciences. All requirements of the Graduate College must be satisfied by each applicant. In addition, applicants for graduate programs in plant pathology are required to take the Graduate Record Examination and to submit their scores with their applications and transcripts. Approval for admittance will be determined by the departmental screening committee and the department head. During the first semester of enrollment, each student, after council with the department head, will select a faculty adviser. Each graduate program is under the direction of the major adviser and a selected faculty committee and is adapted to the needs of the graduate student. There is no graduate credit for courses below the 4000 level. Each student will follow a program of study and research approved by his or her committee and, except for the Master of Agriculture degree, must submit an approved thesis.
College of Arts and Sciences

Smith L. Holt, Ph.D., Dean
Neil J. Hackett, Ph.D., Associate Dean
Mary Rohrberger, Ph.D., Director of Curricular Affairs and Academic Programs
Stanley D. Green, M.M., Director of Extension
Robert L. Spurrier, Jr., Ph.D., Director of the Honors Program
David A. Francko, Ph.D., Director of Research
William Ivy, Ph.D., Director of Student Academic Services

The College of Arts and Sciences not only offers within itself a wide variety of programs in teaching, research and extension, but also underpins and reinforces all the other programs of the University as a whole. Apart from strong programs in the basic natural and social sciences and in the liberal and fine arts, the College provides a number of more specialized and interdisciplinary strengths, and a variety of professional and preprofessional training. Its 29 academic units, of which 23 operate as departments and five are grouped in two schools (Health, Physical Education and Leisure; and Journalism and Broadcasting) offer more than 57 degree programs at the bachelor’s level, and in conjunction with the Graduate College, 23 master’s and 14 doctoral degrees.

The Department of Economics, which belongs administratively to the College of Business Administration, offers B.A. and B.S. degrees through the College of Arts and Sciences. The Department of Biochemistry, which belongs administratively to the College of Agriculture, offers the B.S. through the College of Arts and Sciences.

Freshmen who are not yet certain of their career or educational goals can enroll without declaring a major in the College of Arts and Sciences and make satisfactory progress toward most degrees, without wasting time or credits, as many as four semesters before they select their major fields of study. Under the careful advising of the Office of Student Academic Services, they can explore possible specializations or combinations of subjects as they complete necessary basic courses.

The College of Arts and Sciences provides academic training and background for a wide variety of professions including: law, medicine, social work, nursing, optometry, veterinary medicine, graphic arts, teaching, writing, foreign service, urban and regional planning, journalism, public service, radio/TV, advertising, public relations, medical technology, military science, public affairs, corrections, child services, interpersonal communications, and fine and performing arts.

Academic Advising

The College of Arts and Sciences strongly recommends that high school students have: four units of English; at least three units of mathematics; three units of science; three units of social studies including American history, world history, and one-half unit of Oklahoma history; two units of foreign language; one unit of arts such as music, theater, painting.

Credit by Advanced Standing Examination

Entering freshmen who believe that they can demonstrate sufficient mastery of a subject to earn advanced standing credit should write to the Office of Admissions for a schedule of advanced standing examinations. The most popular examinations are in foreign languages, English, mathematics and American history and government.

Scholarships

A number of undergraduate scholarships are available through the College and through the departments and schools within the College. Interested students should inquire in the Office of Student Academic Services for a list of available scholarships. Arts and Sciences students are also encouraged to apply for the variety of scholarships available through the general University which are listed in the "Financial Aid" section of the Catalog.

High School Preparation

The College of Arts and Sciences strongly recommends that high school students have: four units of English; at least three units of mathematics; three units of science; three units of social studies including American history, world history, and one-half unit of Oklahoma history; two units of foreign language; one unit of arts such as music, theater, painting.

Credit by Advanced Standing Examination

Entering freshmen who believe that they can demonstrate sufficient mastery of a subject to earn advanced standing credit should write to the Office of Admissions for a schedule of advanced standing examinations. The most popular examinations are in foreign languages, English, mathematics and American history and government.

Scholarships

A number of undergraduate scholarships are available through the College and through the departments and schools within the College. Interested students should inquire in the Office of Student Academic Services for a list of available scholarships. Arts and Sciences students are also encouraged to apply for the variety of scholarships available through the general University which are listed in the "Financial Aid" section of the Catalog.
taking a senior Honors thesis (or similar creative
of its kind at Oklahoma State University. It provides
sion and writing. Honors seniors complete the
ical issues each semester in formats which
Special Honors seminars provide coverage of top-
resources of a major comprehensive university
courses allow participating students the benefits
with personal faculty attention to each student.
A student seeking a second degree in the Col-
the A&S Honors Program is based on maintain-
attention can be provided to Honors students in
students in that department to assure that personal
grade-point average. Eligibility for continuation in
ments for the bachelor's degree with Honors.
Priority enrollment is provided for students who
are active in the A&S Honors Program. This allows
Honors students to select Honors courses and
other courses taught by outstanding faculty at the
earliest possible date each semester and facilitates
the development of class schedules tailored to the
special needs of Honors students.
Eligibility for admission to the A&S Honors Pro-
gram as a first-semester freshman is based on the
student's composite ACT score of 27 or higher.
Students with scores of 25 or 26, combined with a
high school grade-point average of 3.75 or
higher, may be admitted at the discretion of the
director. Later entry is permitted on the basis of
a cumulative grade-point average of 3.50 or
higher. Transfer students are eligible on the basis of
the required ACT score and a 3.50 cumulative
grade-point average. Eligibility for continuation in
the A&S Honors Program is based on maintain-
ing a 3.50 cumulative grade-point average.
The Arts and Sciences Honors Program Office
is located in 216 Life Sciences East and Honors
students are encouraged to contact the director of
the A&S Honors Program at any time for
assistance. In addition, each academic depart-
ment in the College of Arts and Sciences has
designated one or more faculty members or aca-
demic advisers to serve as the Honors contact for
students in that department to assure that personal
attention can be provided to Honors students in
every academic major.
Bachelor of University Studies. For the student
who has an academic objective which cannot be
fulfilled by any of the regular degree programs,
an individual plan of study fitted to the particular
needs of the student may be devised with the
approval of the student's adviser, dean and the
Office of the Vice-president for Academic Affairs
and Research.
Area Studies Certificates. International Studies.
Students at OSU are encouraged to add an inter-
national aspect to their education by earning an
activity), and Honors seniors also may earn Honors
credit by enrollment in graduate seminars.
Three Honors Program awards are available to A&S students-the general education Honors
diploma, the departmental Honors award in the
student's major field, and the bachelor's degree
with Honors (which is earned by completing both
general education and departmental Honors
requirements). These awards are reflected on the
student's transcript, and a special Honors diploma
is awarded to students completing the require-
ments for the bachelor's degree with Honors.
Priority enrollment is provided for students who
are active in the A&S Honors Program. This allows
Honors students to select Honors courses and
other courses taught by outstanding faculty at the
earliest possible date each semester and facilitates
the development of class schedules tailored to the
special needs of Honors students.
Eligibility for admission to the A&S Honors Pro-
gram as a first-semester freshman is based on the
student's composite ACT score of 27 or higher.
Students with scores of 25 or 26, combined with a
high school grade-point average of 3.75 or
higher, may be admitted at the discretion of the
director. Later entry is permitted on the basis of
a cumulative grade-point average of 3.50 or
higher. Transfer students are eligible on the basis of
the required ACT score and a 3.50 cumulative
grade-point average. Eligibility for continuation in
the A&S Honors Program is based on maintain-
ing a 3.50 cumulative grade-point average.
The Arts and Sciences Honors Program Office
is located in 216 Life Sciences East and Honors
students are encouraged to contact the director of
the A&S Honors Program at any time for
assistance. In addition, each academic depart-
ment in the College of Arts and Sciences has
designated one or more faculty members or aca-
demic advisers to serve as the Honors contact for
students in that department to assure that personal
attention can be provided to Honors students in
every academic major.
Bachelor of University Studies. For the student
who has an academic objective which cannot be
fulfilled by any of the regular degree programs,
an individual plan of study fitted to the particular
needs of the student may be devised with the
approval of the student's adviser, dean and the
Office of the Vice-president for Academic Affairs
and Research.
Area Studies Certificates. International Studies.
Students at OSU are encouraged to add an inter-
national aspect to their education by earning an
Area Studies certificate. Certificates are offered in
Asian, African, Latin American and Russian and
Eastern European Studies.
The Area Studies certificate is granted upon
successful completion of all requirements for a
bachelor's degree in the student's major and of
the following certificate requirements: (1) six credit
hours of second-year level instruction in a lan-
guage of the area chosen; (2) five upper-division
courses (15 credit hours) pertinent to the area cho-
(3) A&S 3603, "Areas Studies Colloquium"
(three credit hours).
For further information and advising inquire at
the Center for Global Studies, 201 Life Science
East.
Ancient and Medieval, Native American, and
Women's Studies. A certificate in Ancient and
Medieval Studies is also available as well as cer-
tificates in Native American Studies and Women's
Studies. Further information may be obtained from
the Office of the Dean of the College of Arts and
Sciences.
High School Teaching Preparation. Students
earning degrees in the College of Arts and
Sciences may, by completing certain qualifying
courses, receive state licensure for teaching in the
secondary schools. Some programs, e.g. in phy-
physical education, cover grades K-12. Full details
may be obtained from departmental advisers or
from the Office of Teacher Education in the College
of Education.
Students who wish to qualify for teaching licen-
sure should consult as early as possible with the
adviser in their fields of interest, and should apply
for admission to teacher education as soon as pos-
possible, and preferably before the end of their sopho-
more year.
It is usually possible to qualify for teaching
license and the bachelor's degree within the 127
semester credit hours required for graduation.
When it is not possible, students may meet the
requirements for the degree and then complete the
licensure requirements by taking additional
courses in a summer session or, in some cases,
by correspondence.
Full teaching certification is awarded by the
State Department of Education when the licensed
candidate has successfully completed a period of
teaching in a school system.
Preprofessional Programs in the Health
Professions. Pre-dentistry, Premedicine, Pre-
osteopathic Medicine, and Pre-veterinary
Medicine. (See also "Pre-veterinary Options" in the "College
of Agriculture" section.)
The preprofessional curricula for medical doc-
tors, dentists, veterinarians, optometrists and osteopaths have the same basic core because
they must prepare students for professional
schools whose admission requirements are almost
identical. These include a strong foundation in
chemistry, biology and physics, the disciplines on
which major advances in the health field depend.
Included also are courses to develop written
and spoken communication skills, which are highly
important for a good relationship with patients, the
public and other professionals.
Beyond this required core, preprofessional stu-
dents may choose courses and a major as freely
as any other students in the College of Arts and
Sciences. Most students concentrate on some
aspect of biology or chemistry, but other subject
areas are not only acceptable but welcomed. Med-
ical schools encourage study in the social sciences
and humanities that contribute to the understand-

political science, psychology, sociology, speech
(communication consultancy), speech pathology, statistics, wildlife and fisheries ecology and
zoology.
Bachelor of Fine Arts (B.F.A.): art (graphic
design and studio).
Bachelor of Music (B.M.): music (elective
studies in business and performance); music edu-
cation (instrumental/vocal certification).
Second Bachelor's Degree. To secure a sec-
ond bachelor's degree, a student must complete
a minimum of 30 semester credit hours in addi-
tion to those required for the first degree. The num-
ber actually needed depends on what a student
must do to satisfy all the requirements for the sec-
ond degree.
A student seeking a second degree in the Col-
lege of Arts and Sciences at OSU should ask his
or her second adviser to submit a degree plan for
the second degree, clearly headed "second of two
degrees," and showing how all the requirements
of the second degree are to be satisfied. The plan
should also state the major, date of award and total
credit hours of the first degree, and indicate those
courses which represent the minimum of 30 addi-
tional hours. The second degree plan should be
sent to the College of Arts and Sciences Office of
Student Academic Services within two weeks after
the student's last pre-enrollment.
Students wishing to complete degrees in two
different colleges at OSU should consult with the
offices of student academic services of both. Con-
current enrollment in two colleges is possible, but
a student must be enrolled in a college for at least
two semesters before becoming eligible for a
degree from that college.
Second Majors and Minors. If a student major-
ing in one field also completes the specified
requirements for a "major" or a "minor" in other
fields, the additional majors or minors may be
noted on the student's transcript. Such specified
requirements may be obtained from the student's
own adviser or from the department in which the
additional notation is sought. The student should,
at the end of his or her senior year, ask the depart-
ment head in the field of additional study to sub-
mit the request to the Office of Student Academic
Services in the College of Arts and Sciences.
Graduate Programs. Master's degrees are offered in most undergraduate subjects, with doc-
lor's degrees available in many. (For details, see
the departmental entries below or consult the
"Graduate College" section in the Catalog.)
Special Academic Programs
Honors Programs. The Arts and Sciences
Honors Program is the oldest and largest program
of its kind at Oklahoma State University. It provides
outstanding students with the opportunity to study,
conduct research, and interact with faculty and
other Honors students in a variety of settings
designed to assist talented students who seek to
make the most of their educational opportunities.
Honors sections of many general education
courses allow participating students the benefits
of small classes taught by experienced members
of the faculty, thus combining the extensive
resources of a major comprehensive university with
personal faculty attention to each student.
Special Honors seminars provide coverage of top-
cical issues each semester in formats which
encourage the exchange of ideas through discus-
sion and writing. Honors seniors complete the
requirements of the Honors Program by under-
taking a senior Honors thesis (or similar creative

Oklahoma State University 41
ing of human beings in their entirety—their history and environment, their attitudes and values, their fundamental motivations, interpersonal relationships and cultural heritage. All of these may affect sickness and health.

Although most students entering a professional school in one of the above fields have a bachelor’s degree, it is possible to apply for admission after three years of college work (two years for a few dental and veterinary schools). OSU permits preprofessional (health-related) students to choose between two alternative bachelor’s degree programs: (1) a specific discipline that requires a minimum of 127 semester credit hours at OSU, or (2) in physiology, a degree program which allows a “3 plus 1” approach, requiring at least 97 semester credit hours at OSU and 30 hours to be transferred from a medical, osteopathic, dental or veterinary school after successful completion of the first year.

Some professional schools do not state a firm minimum grade-point average for admission, but a student should maintain better than a 3.00 grade-point average to be competitive. The specific admission requirements of medical, dental and veterinary schools are compiled in catalogs available in the offices of each preprofessional adviser and in the Office of Student Academic Services. The OSU pre-veterinary course requirements are listed under “Pre-veterinary Medicine Curriculum” in the “College of Agriculture” section.

All applicants for medical schools must take the Medical College Admissions Test (MCAT) and dental applicants must take the Dental Admission Test (DAT) prior to admission. The OSU College of Veterinary Medicine requires the General Test and the Advanced Biology Test of the Graduate Record Examination (GRE) within the previous four years.

Allied Health Professions. The allied health professions for which one can prepare at Oklahoma State University include dental hygiene, nursing, occupational therapy, optometry, pharmacy, physical therapy, physician’s assistant, radiation technology, corrective therapy and athletic training. Each of these programs requires that the final phase of the education and degree program (usually two to three years) be completed elsewhere in a professional program. The College of Arts and Sciences offers the general education and basic science courses which one must complete before he or she can be accepted into a professional program. Students whose goal is admission to a professional program in the allied health professions should seek consultation with the senior academic counselor-coordinator of health professions advising for information regarding the specific requirements of particular programs and schools.

Medical Technology: See "Department of Botany and Microbiology."

Pre-law Program. Law schools have no preference for a specific undergraduate major. Admission to law school is normally based upon a strong record achieved in a rigorous undergraduate program and an acceptable score on the Law School Admission Test (LSAT).

Law school admissions officers most frequently recommend that students include in their undergraduate programs courses in economics, literature and languages, psychology, history and government, mathematics, logic, philosophy, accounting and speech. Courses in these areas are especially helpful as one seeks to develop the verbal and analytical abilities which are particularly critical for success in law school.

Pre-law students may select courses in consultation with a pre-law adviser in the Office of Student Academic Services until such time as they choose a particular degree program.

Library Science. Students who wish sound undergraduate preparation for admission to an accredited graduate library school should consult the adviser in the preprofessional program for librarians (Library, Room 510) concerning lower-division courses and the selection of an appropriate major field. Special aptitudes and interests are important in the selection of a specialization in librarianship. For general librarianship in public libraries, a humanities-related major is strongly advised, but specialists such as law or information-retrieval librarians are better served by undergraduate majors in social sciences or mathematics.

In the upper-division program, along with the required number of courses in the chosen Field of Concentration, students should take from 12 to 15 credit hours of basic library courses, including those usually required as prerequisites for the master’s degree in library science. At least one modern foreign language is usually required, and a broad general background emphasizing the current literature of as many fields as possible is desirable. Students will receive individual attention to prepare them for the type of librarianship they prefer and for the graduate school of their choice. Early admission to the preprofessional program will make it possible to avoid delay and to obtain a master’s degree in as little time as two semesters.

Graduation Requirements

General Education Requirements. The General Education Requirements for the degrees offered by the College are shown for each program in Undergraduate Programs and Requirements. They total 40 credit hours for the B.S. and B.A. degrees.

All degrees include a common core of 12 credit hours. Three credit hours of American history and three hours of American government are required. These must be satisfied by HIST 1103 or 1483 or 1493 and POLSC 1013. Six credit hours of English composition is a University requirement, and this must be satisfied by English 1113 or 1313 and 1213 or 1413. Students who obtain a grade of "A" or "B" in ENGL 1113 may substitute ENGL 3323 for ENGL 1213. (See also "English Proficiency Examination," below.)

The remaining 28 credit hours must be distributed as follows: six credit hours of social sciences, six hours of humanities, eight hours of natural sciences, three hours of abstract and quantitative thought, three hours of communication systems, and two hours of elective.

College Requirements. In addition to the 40 hours of general education, the college requires one credit hour of orientation, A&S 1111, for both the B.A. and the B.S. degrees. For the B.S., nine additional hours of natural or mathematical sciences are required, as well as three additional hours from the humanities or arts. For the B.A., nine additional hours of humanities or arts are required, as well as three additional hours of natural sciences. Courses listed under "Pre-veterinary Medicine Curriculum" in the "College of Agriculture" section.

Foreign Language Proficiency Requirement. For the B.A., the foreign language requirement is 10 credit hours in one foreign language. Five hours in one language and five in another do not satisfy the requirement. The ten hours represent the first year of work in the language in college and are roughly equivalent to two years of work in high school. The courses are normally 1115 and 1225. Proof of equivalent proficiency must be recorded on the student transcript, by either an advanced standing credit or completion of a second year course or above in the language. FRNCH and GRMN 3013, 3023, FRNCH and SPAN 4113, RUSS 3123, 4113, and 4223 do not satisfy this requirement.

For the B.S. degree, proficiency in a foreign language may be demonstrated by a high school transcript showing two years of high school study in a single foreign language or by college or advanced standing credit showing completion of one year of college study or a higher level course.

Non-Western Requirement (B.A. and B.F.A. only). One three-hour course in Non-Western studies from: A&S 3603 (Asian studies); ART 4633, 4643; CHIN 2115; 2123, 2223; ENGL 3173; FLL 3500, 3503; GEOG 3363, 3753; HIST 3013, 3203, 3403, 3413, 3423, 3433, 3980, 4613; JAPAN 2115, 2123, 2223; PHIL 3493; POLSC 3213, 3223, 3253, 3313; REL 3403, 3413, 3533, 3613, 4113, 4400, 4613.

International Dimension Requirement (all degrees). Three hours of credit in courses which foster understanding of, or the ability to communicate with, peoples and cultures of other countries. Courses satisfying this requirement are designated "I" in the Catalog and a list is available from any adviser or from the Office of the Dean of Arts and Sciences.

Scientific Investigation Requirement (all degrees). One course including an investigative laboratory giving experience with scientific method. Courses satisfying this requirement are designated "L" in the Catalog and is available from any adviser or from the Office of the Dean of Arts and Sciences.

The Non-Western, International Dimension, and Scientific Investigation requirements may be satisfied by courses used also to satisfy any other part of a student’s degree program (i.e., in General Education, College, Major, ENDWC, or Electives requirements). No additional hours are required.

Additional College Requirements. For both the B.S. and the B.A., six hours of general education designated courses are to be taken at the 3000 level or above and 12 hours of college Enhanced Discussion/Writing Component (ENDWC) courses are to be included in a student’s plan of study. A list of current college ENDWC courses may be obtained from any Arts and Sciences adviser or the Office of Student Academic Services.
The English Proficiency Examination. All candidates for a bachelor's degree must pass the University English Proficiency Examination. See "University Academic Regulations."

Mathematics Proficiency Requirement. All candidates for a bachelor's degree must pass the Arts and Sciences Mathematics Proficiency Examination or satisfy one of the following conditions:

1. Receive a grade of "A" or "B" in MATH 1314, 1513, 1513, or 1715; or
2. Receive advanced standing credit for any one of the courses listed in number (1) above; or
3. Receive a grade of "C" or better in any calculus course, that is, MATH 2265, 2265, 2373, 2383, 2713.

4. Pass the Arts and Sciences Mathematics Proficiency Examination prior to filing a diploma application. Students are encouraged to take the examination as early as possible. The examination is administered, by appointment, to individual students by the University Testing and Evaluation Service. A small fee will be charged for the administration and grading of the examination. Students who fail the examination will be required to take it again until they have demonstrated proficiency.

Major Requirements. At least 40 semester credit hours as specified by the department, including courses in the major and in supporting fields, must be completed. These 40 hours constitute the student's Major Requirements.

Upper-division Credit. A student must successfully complete at least 50 semester hours of upper-division credit, i.e. credit in courses at the 3000 or 4000 level.

Elective Hours. College policy allows students a minimum of 18 hours of free electives within a plan of study. Exceptions must be approved by the dean of the college.

Hours in One Prefix. If a student seeking a B.A. or B.S. degree takes more than 42 semester credit hours in one subject, including both lower-division and upper-division credit, the hours in excess of 42 will be added to the minimum total of 127 hours required by the College for a bachelor's degree. For example, if a department were to require 46 hours in one subject for a B.S. degree, the minimum requirement for a B.S. degree in that subject would be 131 hours. If a candidate for a B.A. in French has 46 hours of credit in French on his or her transcript, he or she must complete a total of 131 hours in order to graduate, instead of the stated total of 127.

This "42 hour maximum" applies to all courses taken in a subject, whether they are required or elective, with the exception of required courses in English composition and American history and government.

Total Semester Credit Hours and Grade-point Average. The minimum number of semester credit hours for graduation is 127. The minimum grade-point average is 2.00 and must be earned in all major courses, in Major Requirements, and all courses applied toward the degree.

Particular degree programs may specify higher grade-point requirements or exceed the 127 hours total. Details are given in Undergraduate Programs and Requirements.

Native Speaker Policy. It is the policy of the College of Arts and Sciences that native speakers of any foreign language (those whose language of instruction in high school was the language in question) may not normally be permitted to enroll in or establish credit in courses in that language at the 1000 or 2000 level. There are no restrictions on higher level courses. Exceptions resulting from degree requirements may be determined by interview with the head of the Department of Foreign Languages and Literatures and the appropriate language section chairman.

Endorsement of Student’s Plan (Graduation Check). Immediately after their last pre-enrollment, before their last semester, students must check with their advisers to ascertain that a degree plan has been sent to the Arts and Sciences Office of Student Academic Services.

Changes in Degree Plan. Once a degree plan has been submitted, a student will not graduate until all requirements on it have been fulfilled. Any deviation in the plan must be recommended by the adviser on a "Change in Plan of Study" card, and sent to the Arts and Sciences Office of Student Academic Services for approval.

Checklist of Graduation Requirements.

1. Total hours. Minimum 127 (see degree sheet). Hours of "F" or "I" or for repeated courses unless officially approved in course descriptions in the Catalog, do not count. ENGL 0123 and MATH 0123 are not applicable to a degree. Students must ascertain that grade reports for the removal of "I"s have been sent to the Office of the Registrar by the instructor who gave the "I".

2. Grade-point average. See individual degree sheets for all grade-point minima, overall, in major, in major requirements, in professional courses, and in student teaching.

3. Validity of credits.
   a. No more than two courses in any one subject or (8 hours in biological science) may be used to satisfy General Education and College requirements.
   b. A course used in the Major Requirements may not be used to satisfy any other degree requirement, except the international dimension, scientific investigation, upper-division general education, ENDWC, and non-Western Requirements.
   c. Pass-no pass Grading System. Courses taken on this campus under the Pass-no pass Grading System (see "University Academic Regulations") may be used only as elective hours. They cannot satisfy any other requirement (General Education, Departmental, Major Requirement, certification).

4. All degree requirements listed above and specified in "University Academic Regulations" and Undergraduate Programs and Requirements must be satisfied.

5. Exemption. A student who believes that he or she has a valid reason for exemption from a College requirement should file with the Office of Student Academic Services a written request which has been approved by his or her adviser. Although general and departmental requirements apply to transfer requirements, all or most of their previous work may be acceptable as substitutions. Students should consult their advisers.

Departmental Clubs and Honor Societies

Advertising Club
Alpha Epsilon Delta (premedical honor society)
Alpha Epsilon Rho (broadcasting)
Alpha Kappa Delta (sociology)
American Association of Petroleum Geologists
American Chemical Society
Angel Flight
Arnold Air Society
Army Blades
Arts & Sciences Student Council
Association for Computing Machinery
Biology Club
Chinese Club
Dobo Slovo (Slavic languages)
Economics Club
HPELS Club
French Club
Friends of the Forms (philosophy)
Gamma Theta Upsilon (geography)
Geological Society
German Club
Japanese Club
Kappa Kappa Psi (band honor society)
Music Business Association
Music Educators National Conference
National Student Speech-Language-Hearing Association
Omicron Delta Epsilon (economics)
Pershing Rifles
Phi Alpha Delta (pre-law)
Phi AlphaTheta (history honor society)
Phi Epsilon Kappa (health, physical education, leisure)
Phi Lambda Upsilon (chemistry honor society)
Phi Mu Alpha (music)
Phi Mu Tau (medical technology)
Pi Mu Epsilon (mathematics)
Pi Sigma Alpha (political science honor society)
Political Science Club
Psi Chi (psychology)
Psychology Club
Public Relations Student Society of America
Ruskin Club
Scabbard & Blade
Sigma Alpha Iota (music)
Sigma Pi Sigma (physics)
Sigma Tau Delta (English honor society)
Society of Physics Students
Society of Professional Journalists
Sociology Club
Spanish Club
Speech Communication Organization
Statistics Club
Tao Beta Sigma (band honor society)
Wildlife Society
Women in Communications

Art

Professor and Head Richard A. Bivins, M.F.A.

The Department of Art provides courses for the following types of student needs: (1) general educational background, (2) major concentrations in art, (3) minor in art for other majors.

Two degrees are offered in art: Bachelor of Art (B.A.) with tracks in studio art and art history and the Bachelor of Fine Arts (B.F.A.), a professional degree. Students may choose one of two options in the B.F.A. program: studio art and graphic design. Fields of concentration available in both degree programs are drawing, painting, printmaking, graphic design, ceramics, jewelry, metalsmithing, sculpture and art history. Because of core curriculum department requirements, the freshman and sophomore years are virtually the same for all majors in art.
Students wishing teacher certification should contact the Teacher Education program in the College of Education or their art adviser. Art majors must attain a grade-point average of 2.50 in art courses in order to qualify for licensure and graduation.

The Department of Art maintains an exhibition gallery, the Gardiner Art Gallery in the Bartlett Center for the Studio Arts, with approximately 200 linear feet of exhibition space and 2600 square feet of floor space. Works by artists of national and international reputation, faculty and student works and cultural artifacts are shown.

Botany and Microbiology

Professor and Head  Glenn W. Todd, Ph.D.

Botany

Botany is the science concerned with the study of plant life. Green plants are the constantly renewable source of food energy for all animals, including man, and it is important that they be thoroughly understood as survival and ecological balance depend upon this knowledge. As populations increase, the need for more and better supplies of food and fiber also increases. The study of botany underlies several applied sciences: agronomy, forestry, horticulture, plant pathology, range, lake and wildlife management.

To major in botany a student should have a strong interest in science with a good background in chemistry, physics and mathematics. Majors with a B.S. degree may qualify for secondary school science teaching licensure, for technical positions with the federal and state governments in plant inspection and plant introduction work, for plant breeding programs, and for various activities concerned with plants in private industry, such as plant biotechnology.

Facilities used in undergraduate teaching include well-equipped plant structure-function and ecology laboratories, constant-environment chambers, greenhouse facilities, a 160-acre ‘ecology preserve' and herbarium with over 125,000 plant specimens. All of the faculty teach and do research in their specialty areas of botany: plant ecology, physiology, anatomy, and plant physiology or cellular and molecular biology, genetics and ecology. Chemistry through organic and mathematics through calculus are also required. Students with an undergraduate major in plant science will have completed a substantial portion of this minimal list upon matriculation; those with a less closely related major may be required to take some background courses without graduate credit. Final authority for each student's plan of study, including courses to be taken at the undergraduate level, resides with the student's advisory committee.

A potential graduate student may be required to take one or more advisory examinations covering the various subject matter areas of botany. The examinations to be taken will be determined by the student's screening or advisory committee. The results will be used to determine course work needed or the level at which the student should proceed.

Demonstrated research competence through submission and acceptance of a thesis or dissertation is required for all graduate degrees. A minimum of one semester teaching experience is required of all M.S. and Ph.D. candidates. This requirement may be satisfied by enrollment in a college teaching practicum course (GRAD 5990) or by one semester teaching experience. The requirement for competence in a foreign language will be determined by the student's advisory committee.

All graduate students are expected to attend and participate in departmental seminars.

The Master of Science Degree. Plans of study must include 30 credit hours including no fewer than 21 semester credit hours numbered 5000 or above, which must include six credit hours of the six and two credit hours of seminar. A minimum of 16 semester credit hours must be in the major department or field above the prerequisites required for entrance into the M.S. program.

The Doctor of Philosophy Degree. The student must complete a minimum of 90 credit hours beyond the bachelor's degree or 60 hours beyond the master's degree. The plan of study must include four credit hours of seminar. No fewer than 25 nor more than 36 hours of BOT 6000 will be allowed in the plan of study. After a Ph.D. candidate has completed most of the course work, qualifying examinations will be scheduled. These will cover major areas of the student's plan of study; all major subdivisions of botany will be included. The examinations will be both written and oral.

Medical Technology

The program in medical technology is designed to give the student the broad general education and the highly technical skills that are required for a successful career in this important medical science. The minimum requirement for the B.S. degree in medical technology is three years of university work and one year of clinical laboratory education (internship) in an approved school of medical technology.

Clinical Laboratory Education. For the B.S. degree and certification, the students will, after three years of university work, complete one year of clinical laboratory education (internship) in a school of medical technology accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) and currently affiliated with Oklahoma State University. Schools of medical technology at the following hospitals are currently affiliated:

- Comanche County Memorial Hospital, Lawton, Okla.
- Mercy Health Center, Oklahoma City, Okla.
- Muskogee General Hospital, Muskogee, Okla.
- St. Anthony's Hospital, Oklahoma City, Okla.
- St. Francis Hospital, Tulsa, Okla.
- St. Mary's Hospital, Enid, Okla.
- Valley View Hospital, Ada, Okla.
Students entering their twelve months of internship must enroll in Medical Technology Clinical Laboratory (MTCL) courses for 12 credit hours during the equivalent fall and spring semesters and for six hours during the equivalent summer session, as follows: Fall-MTCL 4117, 4125; Spring-MTCL 4236, 4246; Summer-MTCL 4325, 4351. A grade of "F" will be given for the first two semesters of internship. Final letter grades will be awarded upon receipt of the final official transcript showing final letter grades in the six MTCL courses from the school of medical technology by the University medical technology coordinator. If a student fails to complete the entire 12-month internship, no course credit will be awarded. Students will pay the regular tuition for the credit hours in which they are enrolled, except that the facilities fees will be waived for the 30 hours of MTCL courses. Students who earn a B.S. degree prior to entering hospital internship will not be required to enroll and pay tuition during internship unless they desire to earn a second B.S. degree in medical technology.

Preprofessional Courses. NAACLS requires a minimum of 16 hours of chemistry, including organic and/or biochemistry and 16 hours of biology, including immunology. The University requirement for the B.S. degree in medical technology is as follows: two semesters of general chemistry; organic chemistry and quantitative analysis; immunology and 10 additional credit hours of upper-division microbiology (physiology must be included in this 10 hours); college algebra and statistics.

Residence Requirements. Although the MTCL courses are considered to be resident credit, the student is required to complete additional resident requirements from regular on-campus courses as follows: 30 hours of resident courses, including 18 hours of upper-division courses listed under Major Requirements on the current degree requirement sheet in the Undergraduate Programs and Requirements.

Grade-point Average Requirements. Students, to be qualified for the B.S. degree, must earn a grade-point average of not less than 2.00 overall and 2.00 in upper-division major courses. Students with less than 2.80 overall grade-point average may find it difficult to gain acceptance to a school of medical technology under current conditions of competition.

Applications and Admission to Internship. Students should apply directly to one or more schools of medical technology about 12 months prior to the beginning date for internship. Approximately 70 percent of students applying for internship are accepted, depending upon the degree of competition in any particular year. The decision on acceptance of any applicant is entirely at the discretion of the hospital-based school of medical technology. Enrollment is limited by the size of the classes in the affiliated hospital-based programs. Satisfactory completion of the clinical laboratory education is required for eligibility to take a certifying examination. The B.S. degree in medical technology is not dependent on a passing grade on the certifying examination.

Graduate Programs

Programs of course work and research leading to the degrees of Master of Science and Doctor of Philosophy are offered by the Department of Microbiology.

Prerequisites. Applicants for admission must have received the baccalaureate degree from an accredited college and must have completed a minimum of 30 semester credit hours in biological and physical sciences. The Aptitude Test portion of the Graduate Record Examination is required of all applicants. An applicant will not be accepted unless at least one member of the departmental graduate faculty agrees to act as the applicant's adviser at the M.S. level. A majority of the departmental graduate faculty must approve an applicant at the Ph.D. level.

The Master of Science Degree. In addition to the general requirements for the degree, the following departmental requirements must be met: 30 credit hours with thesis. The plan of study must include six credit hours in MICRO 5000, one credit hour in MICRO 5160, and 12 credit hours in formal courses in Microbiology, of which at least eight credit hours must be at the 5000 or 6000 level, not including MICRO 5000 or other zero-ending numbers except with a prior majority approval by the departmental graduate faculty.

All candidates for the M.S. degree are expected to attend and participate in all departmental seminars. A final oral examination covering the thesis is administered by the advisory committee.

The Doctor of Philosophy Degree. The study plan must include 45 credit hours in formal courses, 22 hours of which must be in microbiology courses at the 4000, 5000 or 6000 level. In addition, two credit hours in MICRO 5160 are required. Students are required to attend and participate in all departmental seminars each semester. Proficiency in a foreign language (French, German, Italian, Russian, or Spanish) must be demonstrated and is required for all Ph.D. candidates in microbiology. This requirement may be satisfied by: (a) passing a graduate proficiency examination given in the Department of Foreign Languages and Literatures or (b) taking and passing (no grade less than "C") the two-semester introductory sequence in the language of choice (e.g., FRNCH 1115 and 1225). Candidates for the Ph.D. degree must pass both a written and an oral qualifying examination.

The written examination, given the last week of May and October of each year, will consist of questions covering the following six areas: (1) microbial systematics and evolution, (2) microbial physiology, (3) microbial ecology, (4) virology, (5) immunology, and (6) genetics. The oral examination will be administered by the candidate's advisory committee only after the written examination has been passed. The final examination covering the thesis (the candidate may be responsible for additional areas if the committee has stipulated such as a requirement for passing the qualifying examination) is given promptly after the candidate has given a public seminar on his or her research work.

Chemistry

Professor and Head Neil Purdie, Ph.D.

Chemistry is the science that deals with the composition, structure and interactions of matter of all kinds. Materials obtained from the earth, such as ores, petroleum and natural gas, as well as those from plants and animals, such as food, fibers and antibiotics, are all studied and modified through chemical means. The chemist creates from natural products new and useful substances that add to the enjoyment of life. He or she creates new agents to combat pests that destroy great portions of food supplies and new drugs to fight diseases of many kinds. Chemists lead the fight against pollution of the environment that results from rapid multiplication of population and of use of energy. Chemists are at the forefront of the search for new energy sources and for ways to better use existing sources of energy.

A great curiosity concerning the physical world should be characteristic of one who is considering chemistry as a profession. The student should want to learn more about the changes of materials and to use his or her knowledge for the betterment of life. The student should have an interest in physics and mathematics since their principles are basic to the study of chemistry.

Chemists are employed by most large companies in this country, especially those that produce foods, medicines, fuels and materials. These chemists work in the areas of research, sales and quality control. Many chemists become teachers in public schools or colleges. State and federal agencies employ chemists for research and analysis. Generally an M.S. or Ph.D. degree is desirable for those interested in research or college teaching.

The Department of Chemistry offers two bachelor's degrees: (1) a B.S. degree that is accredited by the American Chemical Society; and (2) a B.S. degree that requires less specialization.

The chemical laboratories are modern and well-equipped with instruments for determination of properties of chemicals and studies of reactions. Individual laboratory work is encouraged.

Graduate Programs

Prerequisites. The student should have at least eight semester credit hours (or the equivalent) in general, analytical, organic, and physical chemistry. The physical chemistry should have been based on mathematics through calculus.

A beginning graduate student must take diagnostic examinations covering one year of undergraduate study in analytical, organic, and physical chemistry before the student enrolls for the first
time. If the student fails to pass one of these examinations, he or she will be required to repeat the appropriate undergraduate course without graduate credit at the first opportunity. No graduate credit may be earned for chemistry courses numbered below 4000. The student may enroll in graduate courses for which the student has passed the entrance examination.

Admission Requirements. Admission requirements are minimal. For admission without qualification, a grade-point average of 3.00 or better is required. Deserving applicants with grade-point averages less than 3.00 are infrequently admitted under probationary conditions. Additional support of the application is sought in the form of three letters of recommendation. Graduate Record Examination scores are not used as a criterion for admission. Recommendations on admission to the Graduate College are made on behalf of the applicant by the departmental admission officer. Acceptance by a permanent adviser is not a prerequisite to admission to the program.

Degree Requirements. A more detailed description of the graduate study program in chemistry is available in a brochure which will be supplied by the department upon request. The requirements set forth below complement the general requirements stated in the "Graduate College" section of the Catalog.

To be admitted and to participate in the departmental colloquium and CHEM 5011 and 6011 are required.

The Master of Science Degree. Students must complete at least 30 credit hours of graduate course work in chemistry or related fields.

Each student must present an acceptable thesis dealing with a research problem and pass a final oral examination covering it and related material. Research on the thesis problem should be started as early as possible in the graduate program.

The Doctor of Philosophy Degree. Work is offered which leads to the degree with specialization in analytical, inorganic, organic and physical chemistry. A major in biological chemistry is offered by the Department of Biochemistry.

The student must pass a qualifying examination in the student's field of specialization. An acceptable thesis must be presented which contains a substantial original contribution to the field of chemistry. The student must pass a final oral examination covering the thesis and related material.

The Doctor of Philosophy degree requires the completion of at least 90 semester credit hours of work beyond the bachelor's degree, divided nearly equally between thesis and course work.

The course requirements are determined by an advisory committee which is appointed for each student.

Computing and Information Science

Professor and Head George E. Hedrick, Ph.D.

Computer science is concerned with theoreti- cal and practical methods of storing, processing and communicating information by means of computers. Professional computer scientists obtain a formal education through the B.S., M.S. or Ph.D. degrees and apply their knowledge to many diversified fields of science, engineering, business and communications. Computing science offers opportunities to both specialists and generalists.

In little more than a human generation, the computing field has evolved from one associated primarily with engineering and scientific calculation to one of significant influence in almost every aspect of modern life. Technical careers in computer architecture and software design, as well as applications in the business and scientific areas, require a thorough knowledge of the principles of computer science. In addition, most managers in any field of industry or government require familiarity with computing techniques in order to be able to understand and cope with, but also to incorporate them into their own decision-making processes.

The department offers the full range of degree programs-B.S., M.S. and Ph.D. The B.S. program consists of a computing science core curriculum with specialization in business applications, computer systems, scientific computation or computer architecture.

The department also has a cooperative education program. Cooperative education is the process of education that formally integrates college studies with work experiences in cooperating employer organizations. It blends classroom study with planned and supervised employment in an area related to the student's major. Students who are in their junior year may enter this program and will alternate semesters in the classroom with semesters on the job. A student will go into the work setting at least three times.

Most B.S. and M.S. graduates obtain positions in industry. Approximately half of the Ph.D. graduates take university teaching and research positions and half are employed in industry.

Computing facilities available include the University Computer Center computers, an IBM 3081K with 32 megabytes of primary memory and a VAX 11/780 and VAX 8350. The department also has six Intel 286/310s, two AT&T 3B2/300 microcomputers and 30 AT&T UNIX PCs, an AT&T 3B15 computer, four AT&T graphics terminals, as well as several microcomputers. These are utilized for instruction, assignments and research projects. Faculty and graduate students also have access to a Perkin-Elmer 3230 (Concurrent XF610) which can be used for experimental software development.

The Department participates in the CSNET and USENIX networks for computing science research and UNIX users. (UNIX is a trademark of Bell Laboratories.)

Graduate Programs

The Department offers degree programs leading to the Master of Science degree, the Doctor of Education degree in higher education, and to the Doctor of Philosophy degree. These programs are designed to prepare an individual to pursue a career in either an academic or an industrial setting. In addition to taking a prescribed set of core courses, a student must take sufficient courses in one of four topic areas: computer organization and operating systems, information systems, numerical analysis and optimization, and programming languages. In addition to course work, a student must complete a thesis for an M.S. degree and a dissertation for a Ph.D. degree.

The core course requirement assures the student of breadth of knowledge in computing science; the freedom to choose one of four areas and additional research assures the student of enough depth in some facets of computing science to be able to carry out independent investigations in those areas and or put concepts and ideas learned to practical use.

For a master's degree, 30 hours of graduate credit, including a six-credit-hour thesis, are required. A master's degree student is required to pass an oral examination over the thesis. There is no language requirement for the M.S.

For an Ed.D. or a Ph.D., 60 credit hours beyond a master's degree or 90 hours beyond a bachelor's degree are required. A dissertation of no more than 30 hours is required. The Ph.D. dissertation must describe original research while the Ed.D. dissertation may be expository. Ed.D. and Ph.D. students must pass (at an appropriate level) written preliminary examinations in an area of specialization. For Ed.D. students, one of the speciality areas must be computing science education. Master's students who pass these examinations at the Ph.D. level are encouraged to pursue a Ph.D. program of study. Reading knowledge of at least one foreign language is required for a Ph.D. but not for the Ed.D. Approximately 250 students graduate each year in the United States with Ph.D.'s in computing science. In general, many academic and industrial positions exist for each Ph.D. graduate.

The candidate's baccalaureate degree need not be in computing science in order to enter this program. Admission to the program does require: (1) an undergraduate degree; (2) successful completion of a 10-hour calculus sequence; (3) demonstrated competence in programming with some procedure-oriented programming language such as ALGOL, COBOL, FORTRAN, or PASCAL; (4) qualifying grade-point average and Graduate Record Examination scores.

English

Associate Professor and Interim Head
Edward P. Walkiewicz, Ph.D.

The study of English literature and language is fundamental to any education. Not only does it provide familiarity with the literary works that shape cultural heritage, but it also develops the abilities to think analytically, to speak and write effectively, and to consider various points of view when dealing with people and ideas. Educated people in almost every career and lifestyle regard these skills as invaluable.

The English Department prides itself on the diversity of its course offerings and on its small lecture and discussion classes. The B.A., M.A. and Ph.D. degrees are awarded through the Department and a full range of courses are offered in seven areas: literature, composition and rhetoric, technical writing, creative writing, linguistics, teaching English as a second language, and film. The number of students in any English class rarely exceeds 30; and in a writing class, including freshman-level classes, the enrollment cannot exceed 25.

An undergraduate English major has three options: a traditional English major, secondary education teaching certification, or an option in technical writing, each of which emphasizes literature and writing in varying proportions. English majors may choose any courses in all historical periods of British and American literature, from early to contemporary, and in all genres-novel, short story, poetry, and drama. Every literature course emphasizes literary appreciation and anal-
yields and allows ample opportunity for discussion and writing. The student in the traditional major may also take creative writing from practicing, published writers and may specialize at the advanced level in fiction writing, poetry writing, and scriptwriting. Also available are courses in linguistics, which is the study of language, and technical writing, which is writing for science and industry.

Many English majors pursue careers directly related to their major, such as in technical writing or in teaching. An English major with a technical writing option would be well prepared to pursue a career in that field. Students who want to teach may earn secondary teaching certification in English through either the Department of English or the College of Education, or they may decide to go to graduate school in order to teach in a college or university. A great many English majors have found the teaching profession a rewarding and challenging one. More students are finding that an English major is excellent preparation for law school because it develops the analytical and language skills lawyers use. But one need not have definite teaching goals to major in English. English majors regularly pursue careers not only in education, professional writing, and law, but also in medicine, the ministry, publishing, government, and business. Professional schools and businesses value English majors both for their communication skills and for their broad-mindedness.

The Department of English serves a great many students other than those majoring in English. It offers a variety of writing courses to fulfill the University's composition requirements; and English courses in literature, technical writing, creative writing, and film are very popular electives for students in all majors. Many students find English such a good complement to their first major that they choose a second major or minor in English. A Bachelor of Arts in English requires 39 hours of lower- and upper-division English courses. An English minor requires 18 hours of English, at least 9 of which must be upper-division. (These hours do not include Freshman Composition.)

Graduate Programs

Graduate study in English at Oklahoma State University allows students freedom of choice. Only one course—"Introduction to Graduate Studies"—is required of all graduate students, and only one additional course—"Teaching Freshman Composition"—is required of all graduate teaching assistants. As a result, all students, in cooperation with their advisers, design their programs in accord with career goals. In addition to American and British literature, the Department of English offers graduate work in composition and rhetoric, creative writing, film, linguistics, and literary theory. At the M.A. level, separate programs in teaching English as a second language (TESL) and in technical writing prepare teachers for the bilingual classroom and technical writers for industry. Ph.D. degree candidates have an additional interdisciplinary area that allows them to blend other disciplines with literary studies. The variety of choices and the flexibility built into the program prepare the graduate to meet the demands of a changing academic marketplace.

Stipends, Scholarships and Awards. All graduate assistants and associates are charged in-state fees. Stipends for graduate assistants and associates are paid on a nine-month basis.

M.A. and Ph.D. Examinations. During their first year in the graduate program, all entering students are required to take a diagnostic examination which tests knowledge of literary terms and ability to perform a stylistic analysis of poetry or prose. Upon completion of all course work, M.A. students take a three-part examination over American literature, British literature, and one of the following subjects: composition and rhetoric, film, linguistics, and literary theory. Ph.D. students are examined in at least three of the five following subject areas (students may exempt, with permission, two of the five areas by virtue of course work):

- American Literature to 1910
- British Literature to 1660
- British Literature from 1660 to 1910
- Modern British and American Literature
- Interdisciplinary Studies: American studies, composition and rhetoric, film, linguistics, literary theory, TESL, technical writing

One of these areas, with the exception of Interdisciplinary Studies, is designated as the student's primary area of study.

Teaching Opportunities. Graduate teaching assistants may enjoy a wide range of assignments, including teaching freshman composition and working individually with students in the writing laboratory. After requiring some classroom experience and demonstrating excellence, assistants may also teach introductory courses in literary genres, creative writing, or technical and report writing.

The Master of Arts Degree. Every M.A. degree student is required to take 24 credit hours of course work and six thesis hours. (Applicants who were not English majors may be asked to enroll in additional hours to sharpen skills.) ENGL 5013, "Introduction to Graduate Studies," is required of all M.A. candidates. The remaining 21 hours of course work will be chosen by students in consultation with their advisers.

In addition to 30 hours of work in English, a dictionary-reading knowledge of one foreign language is required. When appropriate, students may use six hours in linguistics or Old English to satisfy the language requirement.

Master's degree candidates prepare either a scholarly or a creative work for thesis credit. A thesis committee consisting of a thesis adviser and two other faculty members supervises this project. Students choose the faculty members with whom they work; the project should be a valuable experience for both candidates and supervisors.

The Master's Program in TESL. Admission to Teaching English as a Second Language. TESL is a program within English having its own course requirements and examinations. Applicants who speak English as a second language should have had an undergraduate concentration in English or the equivalent in practical experience. After initial testing and counseling, TESL students may be asked to enroll in a course designed to improve their command of English. Applicants who speak English as a first language need not have majored in English, but they must have completed at least six hours of upper-division foreign language training. Native speakers who have not done so should expect to complete two semesters of foreign language courses in addition to English requirements.

TESL Examinations. TESL examinations cover four areas: traditional English grammar, TESL methodology, and two areas chosen by the student.

TESL is especially relevant to the public school classroom as a result of recent legislation concerning bilingual education. Teachers in English and other areas of expertise will find this program especially useful. This program, however, does not serve as a substitute for teacher certification. (A special TESL brochure is available.)

Course work. Plan I: 24 hours of course work and a thesis for a maximum of six hours are required. Plan II: 33 hours of course work and a research project or substantial paper are required.

The Master's Program in Technical Writing. Admission to the Technical Writing Program. Technical writing is a program within English having its own course requirements and examinations. Applicants should have a background in a technical area and in technical writing. Following a review of previous academic and work experience, as well as the results of a diagnostic test, students may need to enroll in courses designed to improve their mastery of a technical area or technical writing or both. Students need not, therefore, have majored in technical writing or a technical area.

Examinations. Examinations in technical writing, in addition to the diagnostic examination, test in areas: technical writing theory, and a choice of two from among language and linguistics, rhetoric and the development of style in technical and scientific literature, British or American literature, or a special field of technical knowledge. Special restrictions do apply to which examination areas the student may select and students should consult the special technical writing program materials.

Course work. Plan I: 24 hours of course work and a thesis for a maximum of six hours are
required. Plan II: 33 hours of course work and a research project or substantial paper are required.

**The Doctor of Philosophy Degree.** A master's degree in English from an accredited university, a graduate grade-point average of 3.50 (on a 4.00 scale), and positive letters of recommendation are the usual requirements for admission to the doctoral program. If one of these factors is not clearly present, admission may be granted with qualifications. The doctoral student is expected to earn 60 hours of credit beyond the hours required for the M.A. Of these 60 hours, a maximum of 20 hours may be devoted to the dissertation.

A dictionary-reading knowledge of two foreign languages is required of the doctoral student. When appropriate, students may use six hours in linguistics or Old English to satisfy one of the language requirements. The doctoral student may also fulfill this requirement by demonstrating mastery of one foreign language. Details about the foreign language requirement are found in the Department's *Guidelines for the M.A. and Ph.D. Programs in English.*

Doctoral candidates submit a dissertation based upon original research and prepared under the guidance of a dissertation committee composed of at least three faculty members from within the Department and one faculty member from outside the Department. Creative writing students may present as dissertations original works in poetry, drama (including filmcripts), or prose fiction. The dissertation is defended orally by the candidate at a public examination in which the argument, credibility, and value of the work are challenged.

**Course Requirement for Teaching Assistants.** In their capacity as teachers, assistants are required to enroll in "Teaching Freshman Composition." This course appears on student transcripts and may be counted for English degree credit.

**Foreign Languages and Literatures**

Professor and Head John A. Schilling, Ph.D.

The Department of Foreign Languages and Literatures offers French, German, Russian and Spanish as major fields of study. Minors may be earned in Chinese, French, German, ancient Greek, Japanese, Latin, Russian and Spanish.

In all languages offered by the Department, elementary courses are available for students with no previous experience. A special intensive course in Spanish (10 credit hours in eight weeks) is offered in the summer session. Students with high school or equivalent foreign language experience will be placed at levels commensurate with their individual proficiency. A major in a foreign language is often supported by study of another language or work in other fields. Many language majors choose to qualify for an international area studies certificate. Several certificates, such as Russian and East European Studies, Asian Studies, Latin American, and Ancient and Medieval Studies, are available. A freshman with a good high school background in language can usually pursue two languages to the level of a major.

The study of foreign languages is a vital and humanizing part of a general education. In a rapidly changing and shrinking world, it offers new cultural insights, breaks down insularity, fosters discipline of thought and expression and leads to a better understanding of one's native language. Foreign language majors may expect to find openings in a wide variety of careers in law, medicine, government, industry and commerce, all of which require a good liberal arts degree. Job opportunities are greatly enhanced for those who combine foreign language study with a major or minor in other disciplines. Moreover, there is a growing demand for foreign language teachers in secondary education. Bachelor of Arts candidates may qualify for teaching licensure without increasing the number of hours required for graduation.

Additional options for study include literature, civilization and culture, and linguistics courses regularly taught in English. Courses are also offered in German for students who need only a reading knowledge of the language.

The M.S. degree in curriculum and instruction, with specialization in French or Spanish, is available for prospective teachers of foreign languages in elementary and secondary education.

**Geography**

Professor and Head Richard D. Hecock, Ph.D.

Geography is concerned with the surface of the earth and its immediate atmosphere. Geographers study the similarities, the differences and interactions among phenomena in this region. Geographers are interested in the economic, social, political and environmental qualities of places, and they are interested in how these attributes interact.

Geographers attempt to understand human behavior by answering such questions as: Where do people work? Where do they live? Why do people make these locational choices? What are the consequences of these decisions and behavior? Because the physical environment is important in many explanations of spatial behavior and spatial patterns, geographers have traditionally concerned themselves with relationships between humans and their environment. What impact do people have on the land? What impact does the land have on people? How do people perceive their environment? How does this perception influence their activities?

Finally, geographers examine spatial patterns and behaviors in specific regional contexts. These analyses occur at many levels-world-wide, national and local. These kinds of studies lead to suggestions for change and improvement-the application of geography to contemporary rural, urban and regional problems. Thus many aspects of urban, regional and national planning are geographic in nature.

No academic discipline has broader interests than does geography, and the Department of Geography allows students the flexibility to pursue studies that lead to a wide range of educational goals and careers. Students with interests in environment, planning, real estate, economic development, international affairs, travel, area studies, management or education are among those which can be accommodated. A geography minor program is also available for those who see geography as complementary to another field of study.

Those who wish to study geography tend to be interested in their own surroundings and in other places. They also possess a curiosity for maps, the basic tool of the field. Students of geography will become familiar with remote sensing, computer graphics, statistics, information systems and cartography-tools which facilitate geographic analysis.

Many careers are available to the geography major or minor. Recent graduates have been employed in urban and regional planning, community development, locational analysis in both the public and private sector, resource planning and management, various forms of domestic and foreign service, cartography and teaching. Geography also provides an excellent foundation for a liberal education and is a good basis for a career in business, industry or government.

The Department possesses a cartographic laboratory and access to a state-of-the-art remote sensing laboratory. It is directly linked to the University's computing facilities through both standard and graphics terminals. Strong support for the economic-business and urban-regional planning geography programs are provided by the College of Business Administration and the School of Architecture. Students with resources management, remote sensing or physical geography interests will find complementary course work in agricultural economics, forestry, geology, biology and civil engineering.

The Department of Geography offers the B.A. and B.S. degrees. An advanced program leading to the Master of Science degree is also available. Geography graduate students may want to be affiliated with the environmental science or historical preservation degree programs.

**Graduate Programs**

The Department of Geography offers work leading to the Master of Science degree. This degree program emphasizes preparation for employment in positions which are enhanced by an ability to recognize and to interpret spatial distribution, and to analyze regions.

Particular emphasis is placed on the applied aspects of geography, with many graduates employed by city, regional, state and national planning agencies. Interdisciplinary work is strongly encouraged, particularly in environmental science, resource management, urban and regional studies, and historic preservation. Recipients of the
Graduate Programs

Prerequisites. The student should have at least 39 credit hours in geology, including all those courses listed as requirements for the B.S. degree in geology at Oklahoma State University. These additional requirements are minimal: a minimum of nine credit hours of chemistry, eight hours of physics, four credit hours of zoology or botany, ten credit hours of calculus, and three credit hours of computer science. Deficiencies in course work must be made up by the student after entering the program. The Graduate Record Examination is required for admission to the program.

The Master of Science Degree. Emphasis in the master's program is placed on classical geology and various aspects of applied geology, such as economic geology, engineering geology, environmental geology, hydrogeology, and petroleum geology.

Each candidate must complete at least 30 semester credit hours of work beyond the prerequisites. As many as 12 of these may be taken in other departments of the University upon approval by the candidate's advisory committee. Each candidate is required to write a thesis. A final defense of the thesis and the research that it documents is required of all students.

School of Health, Physical Education and Leisure

Professor and Director George H. Oberle, P.E.D.

The School of Health, Physical Education and Leisure provides programs in the health, physical education, and leisure professions. These programs are designed to give students a professional foundation for careers in recreation and leisure services. The program is accredited by the National Recreation and Park Association in two areas: therapeutic recreation, and administration and management. The curriculum prepares students for professional opportunities in recreation program services for Armed Forces, camps, outdoor recreation areas, churches, colleges, unions, fitness centers, schools, youth-serving agencies, and institutions serving special populations such as the ill, disabled, handicapped, aged and incarcerated.

The purpose of the general studies courses in leisure is to assist individuals in the development of capabilities for use of personal leisure. Courses are designed to provide individuals with the knowledge and skills necessary to appreciate the importance of activity and physical fitness for everyday living in both working and leisure time pursuits; to assist them in developing a satisfactory level of performance in such leisure time activities as sports, dance and aquatics, and to give a basic understanding of the body and its functions.
Physical Education

Associate Professor and Coordinator Sandra K. Gangstead, Ph.D.

The program of physical education includes a curriculum designed for professional preparation in physical education in one of two areas: certification for teaching physical education and health in grades K-12; and sports science.

An Oklahoma State University coaching certificate (24 hours) and a program for licensure in athletic training (24 hours) are also available. The teacher education, K-12 certification option qualifies students to teach physical education, grades kindergarten through 12.

For students not interested in teaching physical education, sports science is offered. The sports science program is designed to educate the student about the fundamental nature of human movement from a scientific perspective. It prepares the student for further study at the post-baccalaureate level in either the physiological or psychological dimension of human performance (exercise physiology, biomechanics, sport medicine, or sport psychology).

Core courses for all physical education students include an introductory course for the discipline, eight hours of sport and dance activities, courses in anatomy, kinesiology, biomechanics, motor learning, exercise physiology, and motor development. Students are required to demonstrate proficiency in reading and writing and have a cumulative grade-point average of 2.00 before being admitted to a degree program in physical education. A 2.50 cumulative grade-point average is required for admittance into the teacher education program and for graduation in all School of HPEL programs.

Graduate Programs

OSU’s School of Health, Physical Education, and Leisure offers graduate programs at both the master’s and doctoral level. The Master of Science degree has three major emphasis areas: health, physical education, and leisure.

Admission Requirements. Depending upon the area of emphasis, a bachelor’s degree in physical education, health education, leisure or a related area is required. Applicants without an approved undergraduate program will be required to make up deficiencies by taking the specified prerequisites. Applicants must have a GPA of at least 3.00; if not, they may be admitted on a provisional basis, depending upon recommendation from the Department. Students are required to meet one of the following two requirements: (1) a GRE score of 950 or an MAT score of 35, or (2) successfully complete a writing sample test administered by the School. Three letters of recommendation must be submitted.

General Requirements. A minimum of 32 hours of graduate credit must be taken for the master’s degree program or 30 hours with six hours for a thesis, including 21 hours of courses at the 5000 level and 16 hours in the School. Graduate students normally carry an academic load of 9-12 semester hours.

Core Courses. Requirements for the master’s degree programs include a basic statistics course and a research design course.

The Doctor of Education Degree. Specializations are available in health, physical education, and leisure.

Admission Requirements. Students entering this program should have a bachelor’s degree and/or master’s degree in health, physical education, or recreation/leisure from an accredited institution; if not, additional course work may be required. Application for admission in this program should be made to the head of the Department of Educational Administration and Higher Education, 309, Oklahoma State University. The applicant should have an undergraduate GPA of at least 2.70 and a graduate GPA of at least 3.20. Students are required to take the Miller Analogies Test.

General Requirements. A minimum of 60 hours above the master’s degree or 90 hours above a bachelor’s degree is required for the Doctor of Education degree. Students must have completed all prerequisites and are required to complete 15 hours specified in higher education. The remainder of the program is individualized and interdisciplinary according to the goals of the student. Ten hours of credit are allotted on the study plan for the dissertation and comprehensive examinations in higher education and in the student’s area of specialization, which are given twice annually, near the completion of course work.

Graduate teaching and research assistantships are available. For further information and application forms, write to the coordinator of graduate studies, School of HPEL, 103 Colvin Center.

History

Associate Professor and Head W. Roger Biles, Ph.D.

History is the record, explanation and interpretation of the totality of man’s activities. The study of history is unique in its capacity to identify the factor in man’s development. History enhances the individual’s knowledge of himself and gives perspective and deeper meaning to contemporary events. Courses in the Department of History are intended to give the student a broad understanding of the evolution of civilizations, peoples, countries and institutions, and an insight into the meaning of this evolution, as well as to prepare graduates for many types of employment.

Because history is basic to many special fields, the Department’s instruction is designed to aid students interested in education, law, journalism, scientific and technical disciplines, public service and business administration. Students in colleges other than the College of Arts and Sciences who wish to pursue the study of history are encouraged to enroll in courses of interest. The Department of History offers a number of courses that satisfy General Education requirements in the social sciences and the humanities. It participates actively in the Honors Program and offers to its majors the option of pursuing a special plan of study leading to a departmental Honors certificate. The Department of History also participates actively in the Area Studies Certificate program.

Graduate Programs

The Department of History offers programs leading to the M.A. or Ph.D. in history. In addition to the general Graduate College requirements, the candidate for the Master of Arts or Doctor of Philosophy degree with a major in history is expected to have a minimum of approximately 30 semester credit hours (including 18 upper-division hours) of undergraduate history courses, with an under-graduate grade-point average of at least 2.50 over all or 3.00 in the last 60 hours of undergraduate work. A student whose undergraduate preparation is deficient or minimal may expect to spend somewhat longer than one year’s study for the master’s degree.

The Master of Arts Degree. Admission to the master’s program requires submission of scores for the verbal and quantitative aptitude and analytical sections of the Graduate Record Examination. Candidates for the Master of Arts degree choose one of three alternative plans. Requirements common to all three plans include completion of a course of study (HIST 5026) in historical methods of research and writing, several graduate seminars, and a two-hour oral examination at the end of the program. Students must maintain at least a 3.00 (“B”) grade-point average. An advisory committee will be appointed for each student during the first semester of enrollment. The three plans are designed for different careers, and the distinctive requirements of each are summarized below:

Plan I-(This plan is recommended for those planning to continue graduate studies at the doctoral level.) Students must complete a minimum of 30 hours of graduate courses in three fields (at least one in United States history and one in non-United States history). These hours must include at least nine hours of seminar offered by the department (reading and/or research), Historical Methods (HIST 5026), and six hours of thesis (HIST 5000). With the consent of the advisory committee, a student may substitute a broad thematic historical field. With the approval of the student’s advisory committee, as many as six hours may be taken in related disciplines.

Fields of study include: Ancient Mediterranean World, Ancient Near East, Classical Mediterranean, Early Modern Europe to 1789, Europe since 1789, East Asia, England, Latin America, Russia, United States to 1877, United States since 1877.
Students must demonstrate satisfactory reading knowledge of one foreign language or competency in statistical and quantitative methods.

Plan II-Students must be pursuing an applied history.) Students must complete a minimum of 33 hours of graduate courses. These hours must include at least three hours of research seminar, six additional hours of seminar offered by the department (reading and/or research), Historical Methods (HIST 5023), an internship (HIST 5030), and three hours of report (HIST 5000). With the approval of the student's advisory committee, as many as 15 of these hours may be taken in related disciplines.

Plan III-Students must complete a minimum of 33 hours of graduate courses in three fields, at least one in United States history and one in non-United States history. (See "Fields of Study" listed under Plan I.) These hours must include at least three hours of research seminar, nine additional hours of seminar offered by the department (reading and/or research), and Historical Methods (HIST 5023). At least six hours of the course work must be in United States history and at least six hours in non-United States history. With the approval of the student's advisory committee, as many as nine of these hours may be taken in related disciplines. Students must submit a copy of a research paper acceptable to all members of the advisory committee to satisfy the creative component requirement.

The Doctor of Philosophy Degree. Admission to the doctoral program requires a satisfactory score on the Graduate Record Examinations, including the Advanced Examination in History. Each applicant must also meet Oklahoma State University requirements for the M.A. degree in history, with a grade-point average of at least 3.20 (on a 4.00 scale) in previous graduate work in history.

No definite course requirements apply to all students. Work necessary to prepare the student for his or her written and oral examinations will be indicated in a plan of study which is prepared and approved by an advisory committee appointed by the dean of the Graduate College. Generally, a minimum of 60 semester graduate credit hours beyond the M.A. degree with a "B" grade average for all courses is required. The prospective doctoral student must offer four fields for examination, one of which may be a pertinent field outside of history. Students specializing in United States history must offer for examination:

1. the United States history field.
2. one chronological or topical field from the following:
   United States Colonial, 1600-1787
   Nineteenth-century United States, 1787-1877
   Modern United States, 1877-present
   United States Economic
   United States Social and Intellectual
   United States South
   United States West
3. two fields from the following:
   Ancient Mediterranean World
   Medieval Europe
   Early Modern Europe to 1789
   Europe Since 1789
   East Asia
   England
   Latin America
   Russia

With the consent of the advisory committee, a student may substitute for one of these fields a pertinent field outside history. At least 12 hours of graduate course work in a field outside history would normally be expected.

Students specializing in non-United States history must offer for examination:

1. four fields from the following:
   Ancient Mediterranean World
   Medieval Europe
   Early Modern Europe to 1789
   Europe since 1789
   East Asia
   England
   Latin America
   Russia
   United States
2. One of these must be United States history.
3. With the consent of their advisory committee, students may substitute for one of these fields (except United States history) a pertinent field outside history. At least 12 hours of graduate course work in a field outside history would normally be expected.

Upon admission to do graduate work at the doctoral level, the student's temporary adviser is the departmental director of graduate studies. Before the middle of the student's second semester, an advisory committee is appointed to assist the student in preparing the plan of study. This committee will consist of four members of the departmental graduate faculty (one from each of the examination fields), including the student's major adviser, who acts as chairman.

No student is admitted to candidacy until he or she has (1) demonstrated a reading knowledge of two foreign languages (proficiency in statistical and quantitative methods of research may be substituted for one of these languages); (2) completed all course work on the plan of study; (3) completed with a "B" grade graduate courses in historical methods and historiography; (4) obtained approval of a proposed dissertation topic; and (5) passed comprehensive written and oral examinations in each of the areas of concentration.

Upon admission to candidacy, the student begins work on the dissertation. Supervised by the major adviser and members of the advisory committee, the dissertation provides the student an opportunity to do original research on a topic within the major area of study. The final dissertation must be submitted to the Graduate College in accordance with the regulations contained in the "Graduate College" section of the Catalog. Upon completion of the dissertation, the student undergoes a final examination. Oral in nature and no more than two hours in length, the examination is primarily a defense of the dissertation.

School of Journalism and Broadcasting

Professor and Director Marian D. Nelson, Ed.D.

At Oklahoma State University, the professional areas of mass communication are grouped in the School of Journalism and Broadcasting (SJB). These areas seek to complement each other with a minimum of duplication.

A modern democratic society cannot live by its ideals if its mass media practitioners are merely competent technicians who worry less about what is reported to the people than how it is reported. Citizens must have accurate information about social, political and economic problems as well as knowledge of actions taken by government agencies at all levels. From village council to Supreme Court, there can be no exception from the rule that public business is the public's business.

To speak to people through radio, television or the printed page requires a knowledge of the people to whom one wishes to speak and an understanding of the world in which they live. Therefore, the curricula of the School of Journalism and Broadcasting are designed to offer more than training in communication techniques. Three-quarters of the SJB student's time at the University is devoted to a liberal education in the arts and sciences. At the same time, the student gains competence in a professional field through courses in the School.

In brief, then, the purposes of the School of Journalism and Broadcasting are:

1. To provide thorough, broadly-based professional education for the mass-media professions.
2. To encourage liberal and cultural background in the arts, literature, languages, and social, biological and physical sciences.
3. To promote scholarly research and professional performance.
4. To provide future media leadership through the preparation of high school and college educators and their participation in professional communication associations.
5. To emphasize high standards of ethics and responsibility in mass communication.

Special Requirements

Any student who elects a specific option from those listed in succeeding pages should meet with an SJB faculty adviser as soon as possible. The ability to type a minimum of 30 words a minute is required for registration in all writing courses beginning with "Newswriting I" (JB 2393). In addition, competence in typing is expected of all majors in the School. Prospective students are advised to prepare for this requirement before enrolling at the University. Proficiency in typewriting can be demonstrated by a high school grade of "C" or better in typewriting or by passing a School type-writing test.
Advertising

Ideas ranging from the introduction of new products and services to public service messages are communicated to mass audiences through advertising. Advertising also provides the economic base for mass media—newspapers, radio and television, magazines, cable—thus freeing them from the political control found in many countries.

Upon a strong liberal arts foundation, majors in advertising build educational experiences which prepare them for work in copywriting and layout, production, management, media selection, market analysis, sales and campaign planning. Basically, the program focuses on decision-making and problem-solving, and includes courses in marketing, psychology, sociology, management and economics. Opportunities for part-time jobs, summer internships and participation in the Advertising Club round out the student's experience.

The Oklahoma State University advertising curriculum is accredited by the Accrediting Council on Education for Journalism and Mass Communications. This means it has the approval of leaders in both education and the advertising profession. The program is affiliated with the American Association of Advertising Agencies, the Advertising Federation of America and the Point of Purchase Advertising Institute.

Journalism

News coverage today has gone beyond routine reporting on police and city hall activities. The modern newspaper or broadcasting station tries to spotlight the diverse components of our complex society. This objective calls for writers with broad interests and special knowledge in politics, religion, science, business, economics, art and public welfare. From the ranks of these reporters come the future print and broadcast journalists.

Programs offered in journalism are:

News-editorial-This program prepares students for writing and editing positions on newspapers, magazines, trade journals, in radio and television news departments, in book editing and in publishing.

Teaching licensure-This program, taken in the College of Education, prepares students to teach journalism at the high school level.

Technical communication—Students may combine agriculture and journalism or home economics and journalism to prepare for specialized work in technical writing and editing. These programs are developed in cooperation with the Colleges of Agriculture and Home Economics.

Community journalism-This option, for those who plan eventually to own or manage weekly or small daily newspapers, requires experience in news, advertising and management, and thus requires a wide range of courses both within and outside the School of Journalism and Broadcasting. This program is an individualized one and should be entered only with the advice and consent of the SJB director.

Journalism majors assist in the publishing of a campus newspaper, The Daily O'Collegian, and in the newsmroom of radio station KOSU. Many juniors and seniors find this work a source of revenue to assist them in the cost of their education. Advanced news-editorial students also spend one summer on an internship with a commercial newspaper or broadcasting station, and some spend the spring or fall semester on a daily newspaper.

Public Relations

Public relations practitioners perform a variety of tasks. As writers, they prepare news releases, speeches, trade-paper and magazine articles, texts of booklets, radio and television copy, product information and stockholder reports. They may supervise the company newspaper, magazine or newsletter, or other company communication programs.

The public relations option is related to and draws upon the news-editorial curriculum, as do the public information departments of government, business and industry. The program is accredited by the Accrediting Council on Education for Journalism and Mass Communication. The public relations program is affiliated with the Society of National Association Publications, International Association of Business Communicators, and the Public Relations Society of America.

Radio-TV-Film

The programs in radio-television-film are designed to prepare students for careers in broadcasting. The program offers professional options: ability in announcing, production, copywriting, news, documentary, sports, sales and management.

The undergraduate degree is offered in these professional options:

Production and performance-For students who wish to hold on-the-air jobs in broadcasting or who desire to prepare for positions as directors and producers of radio and television programs.

Broadcast Journalism-For students who wish to write, edit and produce news, discussion and documentary programs for broadcasting stations, networks and cable companies.

Sales and management-For students who wish to write, sell and produce commercial messages, and to move into management and/or ownership positions on radio and television stations.

The facilities of the University's color-equipped Telecommunications Center, and a full-time radio station, KOSU, and an electronic news-gathering laboratory (ENG), make it possible for majors to acquire experience along with professional studies. Radio-television-film is affiliated with the National Association of FM Broadcasters, Radio Advertising Bureau, Oklahoma Association of Broadcasters, National Association of Broadcasters, Radio-Television News Directors Association, Broadcast Education Association and National Public Radio.

Graduate Programs

The School of Journalism and Broadcasting offers courses leading to the degree of Master of Science in mass communication. The School also cooperates with the College of Education in planning and supervising study leading to a Doctor of Education degree with emphasis in mass communication.

Prerequisites for unqualified admission to the master's program include a bachelor's degree in an area of mass communications with an overall grade-point average of 3.00. Potential doctoral candidates must have a bachelor's or master's degree in a mass communication area, in addition to professional experience. A graduate of a non-mass communication discipline may enter the Master of Science program, with stipulation that he or she completes, without graduate credit, foundation courses relevant to career interest.

Basic emphasis is on application of current communication theories and research methods and designs to the professional aspects of mass communication. Effective in the behavioral sciences are encouraged.

Mathematics

Professor and Head Marvin S. Keener, Ph.D.

Contemporary mathematics is concerned with investigations into far-reaching extensions of such basic concepts as space and number and also with the formulation and analysis of mathematical models arising from varied fields of application. Mathematics has always had close relationships to the physical sciences and engineering. As the biological, social and management sciences have become increasingly quantitative, the mathematical sciences have moved in new directions to develop interrelationships with these subjects.

Mathematicians teach in high schools and colleges and work in industry and government. In industry a mathematician typically serves either in a consulting capacity, giving advice on mathematical problems to engineers and scientists, or as a member of a research team composed of specialists in several fields. Among the qualities which he or she should possess are breadth of interests and outlook, the ability to think abstractly and a keen interest in problem solving.

An undergraduate specializing in mathematics will begin with calculus or sometimes with college algebra and trigonometry. Well-prepared students are encouraged to establish credit in elementary courses by passing advanced standing examinations. All majors take courses in differential equations, modern algebra and analysis. The remainder of the field of concentration is determined by the student's interests and future plans. Courses are available that serve as preparation for graduate work, for high school teaching and for employment in industry. Students are encouraged to acquire proficiency in computer programming and to take substantial work in related fields in which they have a special interest.

Many of the more challenging positions in mathematics require study beyond a bachelor's degree. In particular, teaching in a junior college requires at least a master's degree and possibly
a doctorate. Approximately 25 percent of the students receiving a bachelor's degree in mathematics go on to graduate work.

Graduate Programs

The Department of Mathematics offers programs leading to the Master of Science and Doctor of Philosophy degrees and also cooperates with the College of Education in supervising a program leading to the Ed.D. degree with emphasis in mathematics.

Prerequisites. A student beginning graduate study in mathematics is expected to have had, as an undergraduate, at least 18 semester hours in mathematics beyond elementary integral calculus including courses in differential equations, linear algebra and modern algebra. An applicant whose preparation is deficient may be admitted to the program, if otherwise qualified, but will be required to remove the deficiency, increasing somewhat the time required to complete work for the degree. Prospective graduate students are advised to take at least introductory courses in related fields such as physics, statistics, and computer science.

The Master of Science Degree. A Master of Science degree requires 32 credit hours of course work in mathematics and related subjects, although some of the course work may be replaced by a master's thesis. Each student must pass a master's examination on basic graduate courses in mathematics. The Department offers a major in applied mathematics designed as preparation for mathematical work in industry and government.

The Doctor of Philosophy Degree. Admission to the Ph.D. program is granted only to students with superior records in their previous graduate study. A minimum of 90 semester credit hours of graduate credit beyond the bachelor's degree is required for the Ph.D. degree. This may include a maximum of 24 hours credit for the thesis. Each student has an individual doctoral committee which advises the student in the formulation of an approved plan of study for the degree. Candidates for the Ph.D. in mathematics must demonstrate, by examination, a reading knowledge of one foreign language, usually French, German or Russian. The most important requirement for the Ph.D. degree is the preparation of an acceptable thesis. This thesis must demonstrate the candidate's ability to do independent, original work in mathematics.

Departments of Military Studies

Coordinator Smith L. Holt, Ph.D.

In agreement with the U.S. Air Force and the U.S. Army, OSU recognizes separate departments of Aerospace Studies and of Military Science as integral academic and administrative departments of the University. These two departments are administered within the framework of the College of Arts and Sciences. The two departments provide instruction under the basic and advanced Reserve Officers' Training Corps (ROTC) programs.

Scholarships

Both the Army and Air Force ROTC offer full scholarships each year for students enrolling in the program. ROTC scholarships provide full payment of tuition, fees and books and $100.00 per month subsistence allowance. Applications for 4-year scholarships may be obtained through local high school principals or advisers and the ROTC departments. Information concerning 2- and 3-year scholarships (male and female) may be obtained by direct contact with the ROTC departments located on campus in Thatcher Hall.

Degree Programs

A Bachelor of Science degree in aerospace studies or military science is offered in the College of Arts and Sciences upon completion of 127 semester credit hours. It combines ROTC training with the College's general education and degree requirements and the opportunity to develop strong programs in a wide variety of other fields. The curricula for these degrees prepare the student for further professional work and for duty with the Armed Forces.

Flexibility

ROTC at OSU offers a variety of programs, giving the student considerable flexibility in charting a path to commissioning in the Army or the Air Force. Programs are designed so that individuals in all OSU colleges, departments and majors can tailor their academic/ROTC curriculum in order to attain commissioned status. Opportunities also exist in both Army and Air Force ROTC for the student to "test the water" early in his or her academic program by participating in basic familiarization courses. Those interested in learning more about ROTC at OSU, or in enrolling, are urged to contact the professor of Aerospace Studies or professor of Military Science in Thatcher Hall on campus.

Aerospace Studies

Professor of Aerospace Studies and Head Col. Albert M. Silva, M.S.

The Air Force ROTC basic program consists of one classroom hour and one leadership laboratory period per week for one credit hour per semester during the freshman and sophomore years. The advanced AFROTC program (junior and senior years) is open on a competitive basis to any student having two years of enrollment remaining. The advanced courses each include three classroom hours per week and one hour of leadership laboratory for three semester hours of credit. Class work and laboratory involvement are designed to prepare the student for his or her future role as a leader in the U.S. Air Force. No military obligation is incurred for non-scholarship students enrolling in the freshman and sophomore courses. Students in the advanced program must successfully complete at least three hours of English composition and a mathematics reasoning course. Those students accepting an AFROTC scholarship must successfully complete at least one semester of a modern foreign language.

Students (male and female) completing the advanced Air Force ROTC program are commissioned as second lieutenants in the U.S. Air Force. Candidates for flight training incur an active service duty commitment of seven or eight years, commencing with completion of flight training. Nonflying officers have a four-year commitment. During their initial active duty, officers compete for the opportunity to attain career status.

Military Science

Professor of Military Science and Head LTC Conrad J. McHugh, M.M.A.S.

Students desiring to expand the scope of their education, while preparing for a dynamic and rewarding career as an officer in the United States Army, active duty, National Guard, or Army Reserve, choose the Army Reserve Officer Training program (ROTC) as an adjunct to their chosen field of study. With courses dealing in a wide range of subjects from leadership to tactics, taught both indoors and out, the Army ROTC program produces 8,000 second lieutenants each year.

The Army ROTC program consists of a basic course and an advanced course. Students desiring to see what the program is like may enroll in up to ten hours of military science with no commitment to the United States Army. During this basic course, emphasis is placed upon leadership, war gaming, individual tactics and skills, rappelling, and land navigation. All lower-division ROTC courses are open to the entire university community regardless of year in school.

Students committing themselves to a commission in the United States Army are permitted to enroll in the Army ROTC advanced course upon completion of the basic course or equivalent. The advanced course consists of 10 hours of academic work taken during the junior and senior year. In addition, participation in a six-week summer camp is mandatory. The advanced course emphasizes further development of leadership skills, offensive and defensive tactics, physical conditioning, ethics, military law, professional and basic military knowledge and skills. Additionally, advanced course students are responsible for the use of required military skills as they act as assistant instructors during laboratory periods, plan leadership laboratories, plan and conduct field training exercises and are responsible for coordinating and supervising departmental extracurricular activities.

Students interested in the Department of Military Science are encouraged to visit with departmental faculty members at any time for further information concerning optional course offerings and class sequence. A number of two- and three-year scholarships are available through the Department. Prior enrollment in military science is not a prerequisite for departmental scholarship application.
Music

Professor and Head Gerald D. Frank, D.M.A.

The music program at OSU serves students who plan careers in the field of music as well as those who desire to participate in any element of a comprehensive music program. Professional instruction prepares students for careers in performance, teaching, or the music industry. The OSU undergraduate degrees are also excellent preparation for graduate school and for church positions.

The student planning to major in music at the university level should consider his or her background carefully. It should include a strong interest in music during high school years and a talent for performance in vocal or instrumental music. Individual lessons, fundamental theory knowledge, and basic piano ability will also be helpful.

The music major may choose from the following degrees: (1) Bachelor of Music (B.M.) in performance, (2) B.M. in instrumental/vocal music education, (3) B.M. with elective studies in business, and (4) Bachelor of Arts (B.A.) in music. In addition, the Bachelor of University Studies allows the interested music student to major in music while earning a second major in an outside field.

The student majoring in a discipline other than music may participate with music majors in all ensembles (choirs, opera, orchestra, wind ensemble, marching band, concert band, jazz bands, and chamber groups) and courses, as well as individual lessons for academic credit.

An active scholarship program provides assistance to music majors as well as non-majors. Students are invited to write for audition information.

Faculty members, students and ensembles present over 100 concerts and recitals annually. The Department also supports an active program of extension and outreach opportunities.

The Department of Music is accredited by the National Association of Schools of Music. Students wishing to major in music should contact the Department of Music to arrange for an entrance audition and interview.

Natural Science

Professor and Program Director, L. Herbert Bruneau, Ph.D.

Graduate Programs

This interdepartmental program leading to the M.S. degree is for science teachers and other individuals who desire a broader program than often given in departmental programs. The reduced emphasis on the methodology of research may more nearly meet the needs of many persons than a concentrated program in a specific area of the sciences.

Purpose. The goal of this program is to provide the student with a breadth of training in science and related subject areas, while concentrating in one area of science. While research methodology is not a principal component, a scholarly and creative activity is an essential part of the degree plan. Courses must be sufficiently advanced in the recognized discipline to provide contact with research in the discipline while providing a review of the fundamental principles involved.

Administration. The program is administered by the dean of the Graduate College with the assistance of the program director. A graduate advisory committee of three faculty members, one of whom will serve as the student’s major adviser, will be named by the dean of the Graduate College for each student admitted to the program. The graduate advisory committee will be responsible for seeing that the plan of study for the degree is properly prepared and followed by the student, and must approve the topic and content of the creative and scholarly component, report or thesis.

Admission Requirements. The student must have a minimum of 30 semester hours of science, with biological, physical and earth sciences represented. An undergraduate grade-point average of 3.00 is required for unqualified admission. Students with a grade-point average below 3.00 but 2.50 or better may be admitted on a probationary basis. Students admitted on a probationary basis must receive a grade of “B” or better in at least 10 credit hours of course work at the 4000 or 5000 level in their first semester as graduate students.

Curriculum and Requirements. Three degree plans are available in this program. The student must complete a 30-credit-hour plan with a six-credit-hour research thesis, a 32-credit-hour plan with a two-credit-hour report, or a 36-semester-hour research thesis, a 32-credit-hour plan with a well-defined creative and scholarly component if either a report or thesis is written. A minimum of 21 credit hours taken at OSU must be at the graduate level (5000) in a recognized discipline of the biological, physical, or earth sciences.

Selected courses from science-related areas may be used on the plan of study with the approval of the graduate advisory committee and the dean of the Graduate College. No specific courses are required for the degree. However, not more than two-thirds of the courses for the degree may be taken in any one of the areas of biological, physical, or earth sciences.

Philosophy

Associate Professor and Head Edward G. Lawry, Ph.D.

Philosophy is an intellectual activity to be practiced and a subject matter to be studied. As an activity, philosophy seeks to analyze, evaluate, and often formulate the ideas, principles and arguments by which experience is understood and explained and by which behavior is directed and justified. No area of experience or behavior—esthetic, political, religious, scientific or moral—is immune to philosophical consideration. The writings produced by great philosophers are worthy of study as models of thought and as artifacts of historical influence and cultural significance. In this latter role philosophy is historically related to the development of every academic discipline.

Courses offered in philosophy fall into three general groups: broad introductory courses which cover a variety of topics, historical courses which proceed chronologically through a sequence of thinkers, and special topic or field courses. Some offerings combine the latter two characteristics. No undergraduate course is intended primarily for majors. Juniors and seniors often find that an upper-division philosophy course related to their area of concentration can supply needed breadth and depth to their studies.

Students may pursue work in philosophy as part of their general education, as a support to their major area of concentration, as a minor, as a major leading to a B.A. degree, as a second major or in connection with a graduate program. Philosophy majors have an excellent educational base from which to pursue careers in teaching, the ministry, law, government service and private business of many sorts. They have available to them one of the most flexible programs offered at the University, for philosophy and philosophy requirements include only two lower-division introductory courses, two upper-division historical survey courses and 21 hours of additional unspecified philosophy courses numbered 3000 or above which permit up to 38 hours of related and elective study in other areas. A minor or a second major in philosophy will complement any other area of study. A philosophy minor requires 18 hours of unspecific philosophy courses, 12 of which must be numbered 3000 or above.

Graduate Programs

The Department of Philosophy offers a Master of Arts degree in philosophy. Under the auspices of the Department of Educational Administration and Higher Education (EAHED) and with the cooperation of the Department of Philosophy, a student can earn the degree of Doctor of Education in higher education with special emphasis in philosophy.

The Master of Arts degree will be especially valuable to persons interested in pursuing predoc- torial studies in philosophy, religious studies, or some other area of the humanities; to persons who already possess an advanced degree and who simply wish to expand their field of professional competence; and to college graduates who simply wish to broaden their own educational horizons.

The degree may be earned through any one of three options: with thesis (usually eight three-credit-hour courses and a six-credit-hour thesis); with report (usually ten three-credit-hour courses and a two-credit-hour report); and with neither a thesis nor a report (usually twelve three-credit-hour courses). Thus the thesis degree requires 30 hours, the report degree requires 32 hours, and the courses-only degree requires 36 hours.

Prerequisites for admission to the program are 24 semester credit hours (at least 18 at the upper-division level) in philosophy including courses in the history of ancient, medieval, and modern philosophy (PHIL 3133 and 3213 or equivalents) and a course in logic (PHILO 1313 or 2303 or equivalents). Students without these prerequisites, but otherwise admissible, may be granted "qualified" or "provisional"status until the prerequisites are satisfied. (Consult the "Master’s Degree Programs" section of the "Graduate College" in the Catalog for general regulations and requirements relating to admission.)

All candidates for the Master of Arts in philosophy degree are required to pass a four-hour written examination on selected major Western philosophical works. This exam must be passed before a student will be allowed to begin work on either a thesis or the report, and normally will be taken about two-thirds of the way through the required course work for the degree. In every case, this examination will be arranged,
administered, and supervised by the three-person advisory committee appointed for, and in consultation with, each student, during the student's second semester of enrollment. This committee will also be responsible for determining the student's plan of study, thesis or report topics, if any, and any other special requirements that may need to be fulfilled.

Master of Arts in Philosophy, with thesis.
1. 24 hours of course work in classes and seminars approved by the student's advisory committee.
2. 6 hours of PHILO 5910, in which two research papers will be prepared. These papers typically will have their origin in graduate seminars taken as part of the plan of study.
3. An oral examination and defense of the thesis for the graduate faculty of the department.

Master of Arts in Philosophy, without report.
1. 30 hours of course work in classes and seminars approved by the student's advisory committee.
2. 2 hours of PHILO 5910, in which two research papers will be prepared. These papers typically will have their origin in graduate seminars taken as part of the plan of study.
3. An oral examination and defense of these reports will be required in a formal presentation to the departmental faculty.

Master of Arts in Philosophy, without thesis or report.
36 hours of course work in classes and seminars approved by the student's advisory committee.

A student may also, in accordance with the policies of the Graduate College, select a graduate minor in connection with any of the three programs, thus permitting a concentration of work in broad areas such as social thought, cognitive science, or religious or political thought.

General requirements concerning the Ed.D. in higher education are listed in the "Doctor of Education" and "Educational Administration and Higher Education" sections. The basic prerequisite is a significant background in philosophy (ordinarily at least 24 semester hours of upper-division and graduate-level work). Depending on the student's record, 40-60 credit hours of philosophy, excluding the dissertation, are normally required, in addition to specific EAHED courses.

Departmental acceptance is required for admission to the M.A. program and the Ed.D. program. Persons who meet the stated prerequisites for the M.A. degree are encouraged to apply directly to the Graduate College for admission. Applications will be forwarded to the Department for evaluation and recommendation of admission status. Persons interested in the M.A. program but who do not meet the prerequisites should contact the head of the Department prior to application. Application for admission to the Ed.D. program must be initiated through the Department of Educational Administration and Higher Education.

Physics
Professor and Head Larry E. Halliburton, Ph.D.

Cosmology and the physical origin of the universe, the use and development of lasers, the nature of the fundamental particles that make up an atomic nucleus, the properties and development of new and exotic materials, and the formulation of predictive theoretical models to describe nature are some of the subjects pursued by physicists. A professional physicist needs to possess critical skills of observation and evaluation. The development of these skills in both experimental and theoretical work provides the focus of the undergraduate program and prepares a student for a career in either applied or pure physics. Physics majors acquire a versatility which makes them highly competitive for careers in industrial research and development, national laboratories, and academia.

The physics program provides a common set of experiences in physics, mathematics and other sciences during the first two undergraduate years. A physics major continues beyond these courses in an individually tailored program in the Department's options program. The final two years are designed to suit the student who anticipates graduate research, as well as those who will seek employment immediately after graduation. The choices offered to undergraduates reflect their career goals. Programs exist in pure physics, materials science, biophysics, engineering physics, chemical physics and geophysics. Many of these include selected courses in engineering, computer science, biological science and mathematics. With this versatility students can choose a program to match their goals and his or her faculty adviser. A physics minor is also possible and the requirements can be obtained from the department head.

Graduate Programs
Prerequisites. Thirty semester hours of physics beyond the elementary course work and mathematics/courses through advanced calculus or differential equations are required.

The Master of Science Degree. The requirements for the master's degree in physics include the successful completion of 30 semester credit hours beyond the B.S. and the submission of an acceptable thesis based on original and independent research. The following physics courses are required: PHYSYC 4163, 5313, 5413, 5453, 5613. In addition, nine semester credit hours of electives must be completed in physics, mathematics, or an allied field. These must be chosen in consultation with the student's advisor. For example, advanced courses in mathematics along with Solid State I and II in physics might be reasonable choices for someone interested in a materials specialization. For others, one or more courses from electrical engineering might be preferable. A maximum of six credit hours of PHYSYC 5000 may be applied toward the M.S. degree. The student must successfully defend the thesis in an oral examination.

The Doctor of Philosophy Degree. Prior to the appointment of the advisory committee, as described in the general requirements of the Graduate College, a comprehensive written examination must be taken. This examination will cover the content of the course work required up to and including the M.S. degree and will be given once a year. It will be given in four parts during three hours each. The results of this examination will be included in a review by the Department of Physics to determine whether the student should be admitted to Ph.D. candidacy.

The following physics courses are required: PHYSYC 5213, 5313, 5413, 5453, 5613, 6313. Also, four of the following six courses must be taken: PHYSYC 5133, 5263, 5663, 5713, 6213, 6713. Additional courses reflecting the candidate's specialization will be required by the advisory committee. Ninety semester hours of credit beyond the bachelor's degree are required, of which a maximum of forty-five can be dissertation research credits. A minimum of two-thirds of the graduate course credits must be in physics. No more than six credit hours of physics at the 4000 level can be counted toward graduate credit and no more than 12 total credit hours in all subjects at the 3000 or 4000 level can be counted toward graduate credit. Courses taken at another institution will be evaluated by a faculty committee to determine whether they satisfy any requirements.

The most important single requirement for the Ph.D. in physics is the presentation of an acceptable dissertation which represents original research work by the student and which demonstrates the student's ability to do independent study as well as to plan and carry out future research in his or her field.

Political Science
Professor and Head Anne L. Schneider, Ph.D.

Political science is the study of politics, government and public policy at the local, state, national and international levels. It is concerned with struggles for power and the exercise of power in the form of institutions, laws and public policies.

Political science seeks to reveal the patterns of behavior associated with politics, to discern the decision-making process in government, to explain the functioning of political and governmental institutions, to appraise alternative public policies and to assess government's role in society.

The principal fields of study in political science are political theory, public law, comparative politics, international relations, public administration, public policy, and American political behavior. Students may receive the Bachelor of Arts or Bachelor of Science degree in political science with a concentration in any of the fields of study.

Political science graduates enjoy a variety of career opportunities-staff positions with international, federal, state and local government agencies; teaching positions in college and high school; policy analysis and research positions with govern-
The Department of Political Science offers a program leading to the Master of Arts degree in political science. Candidates for the M.A. degree may choose from two plans. Plan A permits specialization in three areas of political science chosen from American politics, comparative politics, international relations, public administration, and public policy, or some other field of specialization offered under the faculty mentoring program. Plan B permits concentration in public administration and public policy. Both programs are designed to prepare men and women for future work in Ph.D. programs as well as policy analysis, general administration and public management careers in government, the nonprofit sector, the private sector and research organizations.

**Admission Requirements.** Admission requirements include a 3.00 GPA; two letters of recommendation; and STAT 313.

**Degree Requirements.** In addition to the general requirements of the Graduate College, requirements for the Master of Arts degree with a major in political science are listed below.

**Plan A:**
1. A minimum of 33 credit hours in political science or closely related courses, including three hours methods; 18 hours of political science graduate seminars (seminars numbered 5000 or above); either a thesis (six hours) or a three-hour creative research paper; and additional graduate-credit courses in POLSC or closely related fields to complete the 33-hour requirement. Students offering a field from outside political science may use up to six hours of non-political science seminar courses to complete their 18-hour seminar requirement.
2. Satisfactory completion of two-hour comprehensive exams administered in the last semester of the student's program, covering three of the five fields (American, comparative, international, policy, public administration). One field offered under the faculty mentoring program or biased on courses from outside political science may be substituted for examination purposes.
3. A minimum grade-point average of 3.00.

**Plan B:**
1. A minimum of 36 credit hours in political science or closely related courses which includes a three-course required theory component (nine hours), a two-course required methods component (six hours), a three-credit-hour required internship, a three-credit-hour required creative component (masters research paper) and 15 hours in an area of specialization.
2. Satisfactory completion of a four-hour comprehensive exam administered in the last semester of the student's program.
3. A minimum grade-point average of 3.00.

**Pre-law.** Many degrees are applicable. See "Arts and Sciences Special Academic Programs-Pre-law."

**Premed and Pre-vet.** Many degrees are applicable. See "Arts and Sciences Special Academic Programs-Preprofessional Programs in the Health Professions."

---

**Psychology**

Associate Professor and Head Vicki Green, Ph.D.

Undergraduate study in psychology provides a background which may be of value to students in personal, social, educational and vocational situations. Many students are better able to understand and deal with their own behavior and that of others as a result of such training. Moreover, the course of study involves examination of some of the major social problems of our time and explores ways of coping with these problems. A bachelor's degree in psychology is useful in a wide number of occupations in business, education and industry. The range of positions obtained by graduates covers almost all occupations requiring direct personal contact with other people. Some examples are supervision, training, sales, public relations and interviewing. Also included are positions with city, state and federal agencies, and in applied research. Although there is no license or certificate to teach psychology in the schools, it is possible to get a teaching certificate or license in social studies education with endorsement in psychology while pursuing a major in psychology. Persons interested in such teaching should contact the Office of Teacher Education. (See "Teacher Education Programs" in the "College of Education" section of the Catalog.)

**Graduate Programs**

Employment in the professional field of psychology almost always requires a graduate degree. Psychologists with advanced degrees have relatively exclusive claim to some professional positions.

The Department of Psychology offers programs of study leading to the degree of Doctor of Philosophy. Students applying for the doctoral degree should have the following prerequisites: introductory psychology, quantitative psychology, physiological psychology, and experimental psychology.

Students in the doctoral program first work toward a Master of Science degree. In addition to meeting the general requirements of the Graduate College, for completion of the Master of Science, students must also:
1. Complete both semesters of a proseminar in general psychology and two semesters of quantitative psychology along with other course credits totaling 32 credit hours.
2. Perform a satisfactory research project, supervised and reviewed by appropriate faculty members.

Following the completion of the master's degree, the student may be admitted to doctoral status in clinical psychology or experimental psychology.

**Religious Studies**

Adjunct Assistant Professor William Ivy, Ph.D.

Courses in religious studies are a vital part of a liberal arts education. The field involves the objective study of religious belief, literature and practice around the world. Opportunity is given for serious and objective study of these aspects in relation to major religions of past and present cultures. Special attention is given to the historical bases of world religions as well as to their effect upon present-day societies, in both the East and West. The courses offered are varied enough for concentrated work in several world religions, biblical studies, religious thought, and religion and culture.

Courses are open to all students without regard to personal views or affiliations. No attempt is made to indoctrinate or to force a particular view upon the student. Emphasis is always placed on the academic study of religion rather than the practice of a particular form of religion.

The undergraduate courses enable students to satisfy humanities requirements and also provide an excellent background for many types of graduate professional programs. The wide variety of course offerings makes possible the quality preparation for further work in seminars and graduate schools. The training and experience of the faculty in varied academic traditions both in this country and abroad make possible the broadest type of counseling on advanced programs leading to careers in religion.

A degree program in religious studies is available for the student desiring a major or minor in the field of study. Interdisciplinary approaches provide for study in the field of religion either as preparation for further advanced work, as specific preparation for teaching, or as an attempt to understand the phenomenon of religion in its complexity.

The curriculum is not designed exclusively or even primarily for those seeking careers in religion. It meets the need of all who desire a well-rounded education which explores and appreciates the human search for deeper meaning to finite life in terms of relationship to the infinite.

**Sociology**

Professor and Head Charles Edgley, Ph.D.

Sociology is the study of people as they live their lives in society. The emphasis is on understanding why people act as they do in a particular society, community or social group.

Many different points of view are represented in the departmental faculty. Some believe that a scientific explanation is central to understanding people in society; others believe that human values and subjective understandings should be the major emphasis in sociology. In all cases, there is an agreement that sociology is an exciting field of study.

The courses in sociology are designed to help the student understand the influence of society on individuals, and find ways to interpret this understanding in real-life working situations. Topics covered include anthropology, corrections, social problems and deviance, research methods, social organization, social psychology, social work and theory. Many undergraduate majors elect to have a supervised work-related intern experience in a social agency of their choosing. A full-time adviser is available to assist undergraduate students in the selection of coursework, advising them on career questions related to career planning. Faculty members are also available to assist and advise students.

B.A. and B.S. degrees are offered in sociological studies. Both B.A. and B.S. degrees include programs in corrections, pre-social work, social gerontology, and juvenile treatment. The general sociology degree has career paths including social...
aspects of law, social aspects of medicine, organizations and administration, social research and analysis, urban/population trends and issues, and minorities.

Anthropology

Anthropology is the study of humankind in all its similarities and differences, both biological and behavioral. As an academic discipline it covers a wide range of subject matter ranging from fossil remains related to early human forms and the biological characteristics of contemporary human populations (physical anthropology) to scientifically excavated remains of past societies (archaeology) to behavior within contemporary human societies (cultural anthropology). Offerings in anthropology provide students with a basic introduction to the concepts and principles found in these three subdisciplines.

Regular course offerings include an emphasis on North American Indian cultures and archeology. Other courses deal with anthropological methods and theory.

Graduate Programs

The Department of Sociology offers the Master of Science and Doctor of Philosophy degrees. Programs are designed to prepare students for appointments to the staffs of sociology departments in colleges and universities, and for research positions in universities, businesses, social agencies, and various levels and units of government. The Department offers concentrations in social psychology, deviance/social problems, social organization, theory, methods-statistics, corrections/criminology, social ecology/department, social gerontology, family, and urban and rural studies.

The Department also offers a Master of Science degree in corrections. This program is suitable for students wishing to specialize in juvenile or adult corrections, as administrators, case managers, counselors, researchers, and as probation and parole supervisors.

The Department offers employment to qualified graduate students as graduate assistants who may teach introductory courses, assist senior professors in the conduct of courses, or participate in ongoing research programs. These teaching and research experiences constitute an invaluable part of the student's professional preparation.

Students seeking admission to graduate programs in the Department must be accepted by the admissions committee, chaired by the graduate student adviser, prior to official admittance and meet the following requirements:

1. Master's level students must have earned an overall grade-point average of 3.00 (on a 4.00 scale) in an undergraduate program and have at least 12 semester credit hours in sociology. Students seeking admission to the Ph.D. program must have earned an overall grade-point average of 3.50 (on a 4.00 scale) in the master's program in sociology or a closely related field. Deficiencies in either degree program may be corrected through course work, without degree credit for such courses, as determined by the graduate student adviser and admissions committee.

2. Those not meeting the grade criteria must take the general aptitude section of the G.R.E. and score a total of 1000 from the verbal and quantitative sections.

3. Three recent letters of reference from academic persons qualified to evaluate the applicant's ability to perform graduate work must be received.

4. All Ph.D. applications should be accompanied by a statement of professional goals and evidence of academic ability (such as thesis or term papers).

Applicants who have deficiencies in any of the above areas, may submit the results of the Graduate Record Examination in support of their application, and that score may be substituted at the option of the faculty.

Detailed information on each program is available by writing to the Department or coming by the departmental office and requesting a Graduate Student Manual.

Speech Communication

Associate Professor and Interim Head Paul D. Harper, Ph.D.

The Department of Speech Communication affords a variety of opportunities for students who wish to become involved in the excitement of a changing world. Not only does the Department offer academic subjects leading to both undergraduate and graduate degrees, but students are afforded an opportunity to gain practical experience in interpersonal and public communication.

In speech communication, students are prepared for positions in industry and business and are qualified to work with interpersonal communication problems. Graduate work in this area increases the student's career opportunities in the field of communication consulting. In addition, the Department's concern with related areas, such as sociology, business and psychology, allows the admission of graduate students with undergraduate preparation in some of these fields.

Graduate Programs

Prerequisites. To enter the program, the student should have a minimum of 12 semester credit hours of undergraduate courses in speech communication or the equivalent.

Admission Requirements. Applicants normally should have at least a "B" grade-point average at the undergraduate level and strong recommendations from those familiar with the student's previous academic background. Beyond that, the number of students admitted will depend on the number of places available in the program.

Program Requirements. The complexity of today's society requires an individual capable of solving a wide range of problems. In order to meet this need, the speech communication graduate program aims at producing: (1) individuals capable of fulfilling the role of a communication consultant or interventionist within governmental, business and industrial, public service, educational and community organizations; (2) individuals capable of using methods and procedures of the behavioral sciences in investigating and solving practical as well as theoretical problems in communication; (3) individuals with the background to pursue doctoral programs in communication; and (4) competent teachers of communication for

two-year and four-year colleges as well as the common schools.

The student may earn the Master of Arts degree under one of the following plans:

Plan I-A minimum of 24 semester hours of speech communication courses and a thesis for which six credit hours is earned.

Plan II-A minimum of 36 semester hours, no fewer than 24 of which must be in speech communication, and a project for which two hours may be earned.

Plan III-A minimum of 36 semester hours, no fewer than 24 of which must be in speech communication, with no thesis or project.

The plan that a student chooses must be approved by the graduate faculty of the Department.

Examinations. Every student must pass a written and oral comprehensive examination. The student following Plan I or II must also pass an oral examination over his or her thesis and related materials.

Speech and Language Pathology and Audiology

Professor and Head John M. Panagos, Ph.D.

The Department of Speech and Language Pathology and Audiology prepares students through the master's level to serve handicapped individuals of all ages who exhibit speech, language and/or hearing disorders. The undergraduate program is a preprofessional degree program. It first emphasizes the study of the development and functioning of the individual who presents normal speech, language and hearing. It also stresses academic and clinical practicum experiences in the nature, symptoms and treatment of those who possess various kinds of communication disorders.

The master's level program is designed to provide students with intensive course work in the various communication disorders and exposure to a wide variety of challenging clinical activities. This includes a full-time, off-campus clinical internship for at least eight weeks which serves as an excellent transition from on-campus practicum to an actual professional position after graduation. Students who graduate from this Department are prepared to take positions in public schools, hospitals, community speech and hearing centers, private practices and other related settings. All graduates meet the academic and practicum requirements for the Certificate of Clinical Competence of the American Speech-Language-Hearing Association and licensure by the state in speech and language pathology. In addition, almost all students elect to earn the state teaching certificate. The program is nationally accredited.

Graduate Programs

Prerequisites. Other than the general requirements of the Graduate College, no other prerequisites are required for the Master of Arts degree.

The amount of course work taken at the undergraduate level in speech and language pathology and related areas will determine the amount of time required for the degree.
Admission Requirements. Applicants should have a grade-point average of 3.00 ("B") in all work and at least a 3.00 in the major, strong letters of recommendation from those familiar with the student's previous academic background, and GRE scores acceptable to the Graduate Faculty. Beyond that, the number of students admitted will depend on the number of places available in the program.

International students follow the same application procedure as U.S. students with one addition. If English is not the student's native language he or she is required to score a minimum of 550 on the Test of English as a Foreign Language (TOEFL) and a minimum of 220 on the Test of Spoken English (TSE). It is especially important that the student have readily intelligible spoken English, because he or she will be conducting therapy sessions in English. International students are eligible to apply for graduate assistantships which also qualify them for in-state tuition. The International Student Services Office is available on campus to assist international students.

Program Requirements. The program leading to the Master of Arts in speech provides a thorough exposure to the nature and causes of communication disorders and to clinical procedures, including extensive practical experience within the OSU clinic and in a variety of off-campus settings, including a full-time internship for at least eight weeks toward the end of the program. All practicum experiences are supervised closely by faculty members or by other highly qualified and certified speech and language pathologists and audiologists. The program leads to the certificate of clinical competence of the American Speech-Language-Hearing Association, state teacher certification, and state licensure in speech pathology.

The student may earn a degree under one of the following plans:

Plan I-A minimum of 27 semester credit hours in courses that examine the nature, causes and treatment of communication disorders and related areas, and a minimum of nine semester credit hours in clinical practicum courses. This includes an eight-week off-campus internship for which the student may receive up to six semester credit hours.

Plan II-A minimum of 21 semester credit hours in courses that examine the nature, causes and treatment of speech communication disorders and related areas including six credit hours for a thesis; a minimum of nine semester credit hours in clinical practicum courses including the eight-week internship.

The plan that a student follows will be determined by the student in consultation with the adviser and with the approval of the graduate faculty in the area of speech and language pathology. Regardless of the plan chosen the student must complete the academic and clinical practicum requirements necessary for clinical certification by the American Speech-Language-Hearing Association. Further, these plans assume that the student have earned undergraduate background comparable in depth and breadth to that obtained at Oklahoma State University. For students with other backgrounds, the listed plans may be altered quantitatively and/or qualitatively in order to better accommodate the educational needs of the student.

Examinations. Students following Plan I must pass comprehensive examinations before graduation. Students following Plan II will not be required to take comprehensive written examinations, but must pass an oral examination over the thesis. All students are required to submit a report at the termination of the internship which critically evaluates the experience.

Nontraditional Students. Part-time graduate study is encouraged for those who cannot be in residence. Courses are scheduled conveniently in the evenings and during the summer term to accommodate nontraditional students who commute to campus. Students who hold bachelor's degrees and who are already employed as speech and language pathologists will be given special assistance. Students holding undergraduate degrees in other fields are encouraged to apply for admission.

Statistics
Professor and Head J. Leroy Folks, Ph.D.

Statistics is the science of learning from data. It is concerned with the development of theory and with the application of that theory to the collection, analysis and interpretation of quantitative information.

Because statistics is important in many scholarly disciplines, a degree in statistics provides the opportunity to enter not only the statistics profession but also many other fields which make extensive use of statistics. The areas of application include agriculture, the biological sciences, engineering, the physical sciences, the social sciences, education, business and home economics, among others. Statistics also promises to be important in emerging endeavors such as pollution and environmental research, energy utilization and health-care administration.

Those who pursue the study of statistics should be interested in scientific inquiry and should have a good mathematical background. In addition it is desirable that they have a genuine interest in some other subject which uses statistics.

Careers in government, industry and education, involving the disciplines previously mentioned, are open to the statistics graduate. In government and industry a statistician usually serves as a researcher or as a consultant to research scientists and decision-makers. In education, of course, the teaching function is added to those of research and consultation. In almost all careers, the statistician uses the computer.

The Statistical Laboratory operates within the Department to provide statistical consulting to researchers both on campus and student-across the campus.

The Department of Statistics offers the B.S. and M.S. degrees to those interested in applications of statistics, and the Ph.D. degree to those who wish to make original contributions to the theory of statistics.

Graduate Programs

Admission Requirements. It is necessary to have an undergraduate degree, not necessarily in statistics or mathematics, to begin a program of study toward the master's degree in statistics. In some instances, it may be advantageous to have an undergraduate degree in another field. However, the student should have acquired a good mathematical background as an undergraduate. This should be equivalent to the required mathematics courses in the bachelor's program (MATH 2265, 2365, 2613, 3013, 4013). Students admitted to the program with deficiencies will be required to remedy such deficiencies.

The Master of Science Degree. The Master of Science degree in statistics may be completed by following one of the three plans listed in the "Graduate College" section. Normally, the all-course work plan will be initiated at the suggestion of the faculty. Each student will be required to attain an introductory knowledge of some field of application outside of statistics, mathematics and computer science. This requirement may be satisfied by having taken a three-hour graduate course in an approved field of statistical application. Each student is required to have completed COMSC 2113 or to have demonstrated competence in a procedure-oriented language such as FORTRAN.

The Doctor of Philosophy Degree. The Ph.D. requires the completion of 90 hours beyond the B.S. degree. A maximum of 30 of these credit hours may be earned by research for the dissertation. Either subject which uses statistics.

The program in theater provides the student with course work and practical experience in all areas. The degree programs are broadly based with academic, humanistic and artistic approaches to the subject matter. Training typically involves not only the most obviously theatrical disciplines such as acting, but also considerable technical skills, literary and historical knowledge, artistic expression, and self-discipline.

Study of theater can lead to many careers besides those in the performing arts. Fields where theater study can be especially helpful include business management, salesmanship, law, politics, teaching, counseling, ministerial professions, or any career area where self-awareness and effective personal communication are essential.

Ambitious seasons of varied productions offer practical experience for both majors and non-majors. A vigorous student organization, the University Theater Guild, develops theater-related projects and provides many services to the production program.

Students with a major interest in theater choose a Bachelor of Arts degree. Students interested in preparing to teach theater and speech in grades 7-12 may choose the B.S. degree in speech/drama education. A strong component of theater courses may also be included in the individualized curriculum leading to the Bachelor of University Studies degree.

Graduate Programs

The Department offers work leading to the Master of Arts degree in speech. The enrollment in the program is typically small, allowing a great deal of individual contact with faculty members and considerable latitude in developing the plan of study.
Students are trained in all aspects of the discipline with the aim of producing graduates: (1) who will be effective teachers and artists in two- and four-year colleges as well as secondary schools; (2) who are artists and/or technicians highly qualified for professional positions; or (3) who have the appropriate background to pursue further study toward M.F.A. or Ph.D. degrees.

The Master of Arts degree may be achieved in accordance with any of the three plans described in the section "Master's Degree Programs" in the "Graduate College."

A limited number of teaching and technical assistantships are available to highly qualified students. Information and application forms may be obtained from the department head. Undergraduate credentials should be referred to the department head for evaluation to assist advisees and to determine any possible deficiencies which will affect the admission status.

Zoology

Professor and Head: Jerry Wilhm, Ph.D.

The Department of Zoology offers degree programs in biological science, physiology, wildlife and fisheries ecology and zoology.

Biological Science

A B.S. degree in biological science is available for students wishing to obtain a broad program encompassing all of the life sciences. By including appropriate course work in their programs, students can obtain licensure to teach in the secondary schools. Requirements for admission to dental, medical and other health-related professional schools can be met through the biomedical option of the biological science degree.

Physiology

Physiology is a division of zoology that deals with the mechanisms and controls of the life processes of animals including man. Since its goal is to explain these processes on the basis of chemical and physical laws, the students of physiology must obtain a strong background in both the physical and biological sciences. The bachelor's degree in physiology requires participation in undergraduate seminars and course work in general biology, genetics, gross and microscopic anatomy, algebra, trigonometry, general physics, general chemistry, organic chemistry, biochemistry, and quantitative chemistry, as well as course work in mammalian and cellular physiology and pharmacology.

The undergraduate degree in physiology is intended primarily as preparation for graduate school or a medically-related professional school (human or veterinary). With its relatively large number of free electives, the B.S. degree in physiology is also an excellent liberal arts experience.

Wildlife and Fisheries Ecology

The wildlife and fisheries ecology program involves comprehensive study in the conservation of renewable natural resources, emphasizing an optimum balance between wild animal populations and habitat requirements. Courses in the wildlife program fulfill the requirements for many other applied and professional careers.

Undergraduates majoring in wildlife and fisheries ecology may choose from communications, fisheries, and management/research. Management/research emphasizes applied wildlife and fisheries ecology, and offers the best preparation for graduate study. In communication, biological training is combined with course work in journalism, social sciences and the uses of electronic media. All three lead to a B.S. degree in wildlife and fisheries ecology.

Assisting in graduate training is the Oklahoma Cooperative Fish and Wildlife Research Unit. Cooperatively funded by the Oklahoma Department of Wildlife Conservation, the U.S. Fish and Wildlife Service, the Wildlife Management Institute and Oklahoma State University, this unit conducts research and demonstration projects and disseminates information obtained through such research. The unit functions in cooperation with the Department of Zoology in which unit leaders hold academic rank and serve as members of the faculty.

Graduate Programs

Programs of research and study leading to the M.S. and Ph.D. are offered in wildlife ecology.

Prerequisites. Applicants must have completed a baccalaureate degree including 40 semester hours in biology and related areas. Applicants must complete the Graduate Record Examination including the advanced test in biology.

The Master of Science Degree. Students must take an oral examination over biological principles administered by the advisory committee during the first six months in order to diagnose weaknesses and to help in formulating a plan of study. In addition to the general requirements, students are required to show competence in a research technique by taking additional courses in statistics, mathematics or computer science. Students must prepare a research proposal and complete either a thesis or a report. If a report is written, 32 credit hours are required. The plan of study must include at least two credit hours in a seminar.

The Doctor of Philosophy Degree. Students must take an oral examination over biological principles administered by the advisory committee during the first six months in order to diagnose weaknesses and to help in formulating a plan of study. In addition to the general requirements, students are required to show competence in a reading knowledge of a foreign language and/or certain research techniques by taking additional courses in statistics, mathematics or computer science. This requirement is in addition to the competence demonstrated for the M.S. degree. The plan of study must include at least four credit hours in a seminar. Departmental courses at the 3000 level are acceptable.
Zoology

Zoology, the study of animals, provides a background for many applied and professional careers. The B.S. degree curriculum in zoology is designed to provide a background of basic biology and some specialization in that area of zoology in which the student wishes to develop his or her career. The B.S. degree requires courses in cell biology, ecology, evolution, genetics, and vertebrate and invertebrate zoology. To become a zoologist the student must also have a good foundation in the related fields of chemistry, physics, mathematics, statistics, and botany.

Graduate Programs

Programs of research and study leading to the M.S. and Ph.D. are offered in zoology with concentration and emphasis in wildlife and fisheries ecology and in cell physiology. Specializations of faculty include animal behavior, animal nutrition, cellular and molecular biology, developmental biology, ecology, evolution, fishery biology, invertebrate zoology, limnology, ichthyology, herpetology, ornithology, mammalogy and physiology.

Prerequisites. Applicants must have completed a baccalaureate degree including 40 semester hours in biology and related areas. Applicants must complete the Graduate Record Examination including the Advanced Test in Biology.

The Master of Science Degree. Students must take an oral examination over biological principles administered by the advisory committee during the first semester in order to diagnose weaknesses and to help in formulating the plan of study. In addition to the general requirements, students are required to show competence in a research technique by taking additional courses in statistics, mathematics, or computer science. Students must prepare a research proposal and complete either a thesis or a report. If a report is written, 32 credit hours are required. The plan of study must include at least two credit hours in seminars.

The Doctor of Philosophy Degree. Students must take an oral examination over biological principles administered by the advisory committee during the first semester in order to diagnose weaknesses and to help in formulating the plan of study. In addition to the general requirements, the student is required to show competence in a reading knowledge of a foreign language and/or certain research techniques by taking additional courses in statistics, mathematics, and/or computer science. This requirement is in addition to the competence demonstrated for the M.S. degree. The plan of study must include at least four credit hours in seminars. At least 25 hours must be 5000 or above, not counting ZOOL 5000 or 6000. Departmental courses at the 3000 level are generally recommended only to make up deficiencies. A student must pass a written and oral qualifying examination, prepare a research proposal, and complete a dissertation based on original research and worthy of publication. Students must take a minimum of 30-36 graduate dissertation credit hours which may include a maximum of six credit hours from the M.S. degree. Candidates must present a public seminar based on the completed dissertation.

Zoology - Physiology

Graduate Programs

Programs of study leading to the M.S. and Ph.D. are offered in zoology with an emphasis in physiology. The programs are designed to develop and train physiologists for teaching and research positions in universities or colleges; research positions in government, foundations, or industry; and related administrative positions. Specializations of faculty include cellular physiology, comparative endocrinology, comparative gastro-intestinal physiology, developmental biology, ecotoxicology, invertebrate physiology, nutritional physiology, and membrane biology. No particular undergraduate major is preferred, but the student should have completed most of the following: histology or embryology, comparative anatomy, introductory physiology, one year of organic chemistry, quantitative analysis, biochemistry or cell and molecular biology, one year of physics, and calculus.
College of Business Administration

Robert L. Sandmeyer, Ph.D., Dean
John T. Bale, Jr., Ed.D., Associate Dean
Robert C. Dauffenbach, Ph.D., Director of Business and Economic Research
James G. Hromas, Ph.D., Director of Extension
Craig B. Robison, Ed.D., Director of Student Academic Services

Today's business world is one of excitement. It offers young men and women a challenging professional future as well as the opportunity for meaningful social involvement and civic service. A steadily increasing number of young people today are choosing careers in business as they seek to shape our nation's economic structure and deal with some of its social problems. New developments in automation, economics, and innovations in management techniques and social responsibility are constantly creating new and exciting opportunities. The College of Business Administration (CBA) at Oklahoma State University assists in preparing students for these opportunities.

The College of Business Administration seeks to accomplish three major objectives: (1) to provide students with a liberal education in a program which includes study in four general areas: behavioral and social sciences, communications, humanities and fine arts, and natural science and mathematics; (2) to provide students with an understanding of the functions of business and other economic units in the American economy, which includes study in the basic areas of accounting, economics, business law, finance, management, management information systems, marketing, production and statistics; and (3) to provide students with the opportunity for specialized study in selected major areas of business.

Academic Advising and Enrollment Procedure
Freshmen will plan their study in conference with a staff adviser in the Office of the Dean of the CBA.

All students should tentatively select a major during their sophomore year. Each student will then be assigned to a faculty adviser from the major field of study. Thereafter, counseling will be provided by the assigned faculty adviser.

The dean and associate dean, as well as the director of the Office of Student Academic Services, are available to all students for counseling on special problems.

Academic Programs

Undergraduate Programs. The Bachelor of Science in Business Administration degree is offered by the five departments and one school of the College. Departmental majors are listed below.

Accounting, with a major in accounting.
Administrative services, with a major in general business.
Economics, with a major in economics and an option in business economics-quantitative studies.
Finance, with a major in finance.
Management, with majors in management with an option in personnel management; management information systems; and management science and computer systems.
Marketing, with a major in marketing.

Graduate Programs. Master's Degrees. Two types of master's degrees are available to students desiring to do advanced work in the business area. One of these is the Master of Business Administration degree (which allows concentrations in management, management science, management computer system, marketing, or finance) and the other is the Master of Science degree, which requires completion of a graduate major in accounting or economics. Only persons admitted to a graduate degree program may take graduate courses in the College of Business Administration.

Doctor of Philosophy Degree. Graduate work toward the Doctor of Philosophy degree with a major in economics is offered in the Department of Economics. Graduate work toward the Doctor of Philosophy degree with a major in business administration is offered in the departments of Finance, Management, and Marketing and the School of Accounting.

Placement Service
Representatives of more than 100 business and industrial concerns and governmental agencies annually interview graduating seniors of the College of Business Administration.

General Education Requirements

The minimum campus-wide general education requirements are summarized as follows: not less than 40 semester hours, including six hours of English composition, and 34 hours in the breadth areas. These include: six hours in American history and government and at least one three-hour course in each of the four areas: natural science, social and behavioral science, humanities, and abstract and quantitative thought. No more than 18 of the 34 hours meeting breadth requirements may be in disciplines directly supportive of the major.

Two other requirements include: an "International Dimension" and a "Scientific Investigation" component. These may be met in any part of the student's program, and thus do not necessarily add to the number of hours required. The International Dimension simply requires each student to learn something about cultures and societies outside the United States. The Scientific Investigation Requirement involves some kind of laboratory experience with student involvement. More detail concerning these and other requirements is found in the next section, "Lower-division Requirements."

Lower-division Requirements

Work in the freshman and sophomore years is planned in such a way as to give the student basic information in the general areas of (1) behavioral and social sciences, (2) communications, (3) humanities and fine arts, (4) natural science and mathematics, and (5) business foundation courses. In order to ensure study in each of these five areas, courses totaling up to 59
School of Accounting
Professor and Head Lanny G. Chasteen, Ph.D., CPA

The School of Accounting offers three degree programs in accounting: (1) B.S. in Business Administration with a major in accounting, (2) M.S. in accounting, and (3) Ph.D. in business administration with accounting as the major field.

The common objective of the B.S. and M.S. accounting programs is to educate students to commence and continue to develop in a wide range of professional accounting careers. The specific objective of the B.S. in accounting program is to provide basic conceptual and business knowledge as a foundation for accounting career development; the objective of the M.S. in accounting is to provide candidates with a greater breadth and depth in accounting than is possible in the B.S. program, in order to prepare graduates for careers as professional accountants in financial institutions, industry, nonbusiness organizations, and public practice.

Students who are considering a professional accounting career should have above-average aptitudes in mathematics and English, disciplined work habits, an interest in working with people, and an attitude of service to mankind.

The B.S. in accounting, including an auditing course, is acceptable in lieu of three years of required public accounting experience required before a candidate may write the Oklahoma Certified Public Accountants' Examination. The M.S. in accounting earned at Oklahoma State University satisfies educational requirements for C.P.A. candidates in all jurisdictions of the United States.

Considerable electives are available in both degree programs. Specialization in auditing-financial accounting, cost-managerial, or tax is possible in the M.S. in accounting program.

Candidates for either of these degrees are encouraged to select some electives in quantitative and behavioral science areas.

Graduate Programs

The Master of Science Degree. The specific objectives of the M.S. in accounting are to provide candidates with a greater breadth and depth than is possible in the B.S. program, in order to prepare graduates for careers as professional accountants in financial institutions, industry, nonbusiness organizations, and public practice, and to develop judgmental ability in accounting and related areas. Advanced courses provide a theoretical base for insight into significant problems confronting the accounting profession. In addition, a specialty in taxation is available for interested candidates. The candidate receives assistance from the faculty in selecting a pattern of courses designed to prepare the student according to the chosen professional goals.

Graduates of recognized colleges and universities whose records indicate adequate intellectual capacity and desirable personal characteristics may qualify for admission. The typical applicant admitted to the program has a GMAT score of 525 or above and an undergraduate grade-point average of 3.25 or above.

Prerequisites. The following are required: 24 semester hours of advanced accounting; six semester hours of business law; business calculus; three semester hours each in finance, management, marketing, production, quantitative analysis, business policy, intermediate microeconomics and 6 semester hours in statistics. As many as eight semester hours of course deficiencies may be removed within the 32 semester hours required for the degree.

The Doctor of Philosophy Degree. The Ph.D. in the College of Business Administration with a major in accounting emphasizes flexibility to meet the particular needs and objectives of individual candidates. The program is designed to provide the highest degree of preparation for the individual student, enabling the student to make significant professional contributions in research, teaching, or in business or government positions.

Graduates of recognized colleges and universities whose records indicate adequate intellectual capacity and desirable personal characteristics may qualify if they have a good academic record and achieve satisfactory scores on the GMAT. Admission is competitive.

The Ph.D. program is designed so that a candidate may, at his or her option, specialize in one of the following accounting areas: auditing, managerial accounting, financial accounting, or taxation. All candidates are required to take a two-semester seminar which provides an overview of relevant academic literature. This seminar is restricted to Ph.D. candidates in accounting. Two minor areas, one of which may be outside the College of Business Administration, are required, in addition to competence in economics and quantitative analysis. The candidate's advisory committee is responsible for assisting in the development of a plan of study encompassing the above areas.

Students in residence are required to do teaching or research on a quarter-time basis while earning the degree.
tion preparing them to enter employment in a wide range of administrative positions in private business, government, or non-profit organizations. The scope of their educational experience enables these graduates to assume management positions in organizations of varying sizes and ranges of operations.

Students majoring in general business will take general education or foundation course work in behavioral and social sciences, communications, humanities and fine arts, natural science, mathematics, and statistics, as well as business foundation courses in accounting, business law, economics, finance, management information systems, management, and marketing.

This major, which provides for a high degree of individual student choice, includes required upper-division course work beyond the business core in each of the business disciplines as well as substantial work in business or business-related courses, selected by the student in consultation with his or her major adviser.

### Business Administration

**M.B.A. Program Director Cynthia S. Gray**

**Graduate Programs**

**The Master of Business Administration Degree.** The Master of Business Administration program provides graduate professional education for individuals preparing for administrative careers in either the private or public sector. It is a comprehensive, yet flexible program providing the knowledge and analytical tools to cope with the complexities of administration within diverse environments.

The program develops fundamental knowledge in the areas of accounting, finance, management, and marketing. Further, it provides critical analytical and research capabilities through research design and computer-based decision courses. The program is a 48-hour, self-contained program. The length of the program for a full-time student is normally two years, but the degree might be earned in less time by attendance in summer session courses. The individual course of study follows a personalized, interdepartmental curriculum developed in conjunction with the graduate adviser. Students may use elective courses either to continue broad managerial development or to emphasize studies in a functional area (finance, management, or marketing).

Outstanding students with baccalaureate degrees in any field of study may apply. No specific prerequisite courses are required for admission; however, it is assumed that students have good quantitative skills before entering the program. The M.B.A. is an advanced studies program that assumes a fair degree of sophistication in mathematics, statistics, computer science, accounting and economics. Admission is granted to those students whose potential for successful graduate study is clearly indicated by the undergraduate grade-point average, the score on the Graduate Management Admissions Test, and information obtained through letters of recommendation.

**The Doctor of Philosophy Degree.** The Ph.D. in business administration is an interdepartmental program in the College of Business Administration. The degree emphasizes flexibility to meet the particular needs and objectives of individual candidates. The program is designed to provide the highest degree of preparation for the individual student, enabling him or her to make significant professional contributions in research, teaching, or in business or governmental positions.

**Requirements. Students select one major area of study from either accounting, finance, management or marketing, and two minor areas. The dissertation is usually written in the student’s major area. One of the minor areas must be taken in the College of Business Administration. The second minor may be taken from another department within the College of Business Administration or from a department outside the College.**

All candidates for the Ph.D. degree in business administration are expected to have a basic competence in all the major functional areas of business administration—accounting, economics, finance, management and marketing. In addition, basic competence is expected in finite mathematics, calculus and statistics. Students who possess a recent master’s degree in business from a program accredited by the Accreditation Council of the American Assembly of Collegiate Schools of Business will generally have satisfied most of the basic competence requirements in these areas.

**Administration.** The program is administered by the dean of the Graduate College and the department in which the student enrolls with the assistance of a faculty advisory committee.

**Major and Minor Areas.** The candidate’s advisory committee is responsible for assisting in the development of a plan of study that assures competence in the major and minor areas and in economics and quantitative analysis. All Ph.D. students in residence are required to do teaching or research on a quarter-time basis, for at least one semester, while earning the degree.

### Economics

**Professor and Head Ronald L. Moomaw, Ph.D.**

Economics is a science of choice. The study of economics centers around individuals’ attempts to improve their living standards. It provides a comprehensive view of how a society is organized to transform the limited resources available into want-satisfying goods and services. It investigates the principles underlying the operation of the economic system, and seeks to determine its weaknesses and to prescribe policy measures that will improve its operation. In the process it ranges over a host of the most important problems confronting contemporary society—the causes of and remedies for depression and inflation, the determinants of and methods for improving income distribution, poverty problems and welfare measures, the role of the government in economic activity, the requisites for economic growth and development, pollution and congestion and their control.

The primary objectives sought in the undergraduate curriculum are to develop a broad understanding and perspective of the economic aspects of man’s activities, coupled with thorough training in the fundamental tools of economic analyses. Toward these ends, the development of elementary mathematical and statistical skills is highly desirable, as is complementary study in the social and behavioral sciences, accounting and business administration.

A major in economics prepares students for positions with business firms, nonprofit private organizations and government agencies. It provides an excellent background for the study of law. It qualifies competent students to undertake the graduate work necessary for professional positions in economic research and college or university teaching. A degree option in business economics and quantitative studies is offered to provide additional training in analytical methods and communication skill for both public and private sector occupations.

**Graduate Programs**

The Department offers work leading to the Master of Science degree and the Doctor of Philosophy degree. The graduate program in economics prepares economists for academic careers as well as research and administrative positions in business and government agencies.

Graduate fields of specialization include monetary economics, public finance, international economics, economic development, econometrics, labor and human resource economics, industrial organization, and urban and regional economics. In addition, graduate courses are offered in the history of economic thought and in mathematical economics.

The initial admission to graduate programs is determined by an elected graduate studies committee on the basis of the applicant’s previous academic record; verbal, quantitative and analytical scores of the Graduate Record Examination; and letters of recommendation.

**The Master of Science Degree.** Admission to the master’s program in economics is granted to college graduates with superior academic records whose preparation has been broad and thorough. They need not have majored in economics as undergraduates but must be well grounded in economic fundamentals. A good background in one or more such fields as history, philosophy, mathematics, statistics, political science, English, sociology, accounting, finance, psychology, or management is particularly helpful to the graduate student in economics. An applicant whose prior preparation is deficient in some respect, may, if otherwise qualified, be admitted to the program but will be required to remove the deficiency, increasing somewhat the time needed to complete work for the degree.
Each graduate student is guided in the preparation of a program of study by a graduate studies committee. At the master's level, there are two options. One option provides the student with a well-rounded program that avoids premature specialization in some particular area of economics. The candidate for the master's degree is required to show competence in basic economic theory and statistical methods, together with an understanding of the fundamental institutional operations of the United States economy. The second option is in applied economics which stresses communication skills, quantitative analysis and course work from other disciplines related to their career objectives.

Each program contains enough electives to permit considerable choice among areas of emphasis. A research report is required of all students who take only the M.S. degree. Those accepted for the Ph.D. program have the option of applying for and receiving the M.S. degree without the research report upon successful completion of the Ph.D. qualifying examination and the filing of an approved Ph.D. thesis topic with the Graduate College. A foreign language is not required.

The Doctor of Philosophy Degree. Admission to the doctoral program in economics is granted to college graduates who have satisfactorily completed at least one year of graduate work in economics and who have superior academic records. This program stresses balanced preparation in economic theory and in mathematics and statistics, as well as competence in subject-area fields of specialization. The student is required to pass qualifying examinations in the theory core and in two fields of specialization. (The theory core is not considered a field of specialization.) Competence must be demonstrated in a third field of specialization, either through course work or by passing a qualifying examination in the field. An advisory committee helps the student plan a program of study to achieve these objectives. A foreign language is not required.

A dissertation based upon original research is required of the candidate for a Ph.D. degree in economics. A final oral examination deals principally with the dissertation and fields to which it is most closely related.

Graduate Programs

Concentrations in finance are offered through the Master of Business Administration and Doctor of Philosophy degrees.

The Master of Business Administration Degree. (See "Business Administration.")

The Doctor of Philosophy Degree. The Ph.D. as offered by the Department of Finance provides intensive study in finance, preparing students for significant professional contributions in university teaching and research or staff positions in business or government.

The program is designed to meet the needs and objectives of individual students, but all students will seek an in-depth understanding of the theoretical foundations of financial economics and develop research skills in finance.

Students will select finance as their major area of study. One or two minor areas are also to be selected. A minor area must be taken in the College of Business Administration from accounting, economics, management, management science, or marketing. The second minor area (if any) may or may not be taken outside the College of Business Administration. As support for the major and minor field of study, each student is required to attain graduate level competence in economic theory and quantitative methods.

Prerequisites for admission to the program are appropriate basic courses in calculus, statistics and computer science.

Competence in planning and executing research is demonstrated by a dissertation. In addition, each candidate must pass comprehensive qualifying examinations and a final oral examination on the dissertation itself.

Outstanding students with degrees in any field of study may apply. Applications for admission are evaluated on the basis of (1) undergraduate and graduate grade-point averages, (2) score on the Graduate Management Admissions Test, (3) a two- or three-page statement describing goals and academic interests, (4) three letters of recommendation, (5) evidence of research potential, and (6) a personal interview when feasible. It is the applicant's responsibility to see that all materials related to these criteria are received by the Department of Finance.

Management

The major in management is designed to prepare students for leadership careers with business or nonprofit organizations as managers. It emphasizes the study of management systems and problems. Students with interests in international management may elect a special option under the management major. Majors are typically employed by organizations of all types and sizes as managers, management trainees or staff specialists. The field of management has much to offer those interested in leadership roles in business and public sector organizations.

Personnel Management

The option in personnel management is designed to prepare students for careers in human resources management. Anything that concerns the work force of an organization is the concern of the personnel manager. This includes working with labor relations and collective bargaining, forecasting the demand for personnel, attracting potential employees, orienting them and then efficiently allocating and utilizing resources. Since people in the field of management deal with real-world problems, the student should have a deep interest in applying knowledge in problem-solving situations. Examples of the kinds of knowledge applied include, but are not limited to, behavioral science, economics, mathematics and statistics, management information systems, communications skills, accounting, and necessary knowledge of theory and methods in management and management science. It is not necessary for students to have interests in each of these areas since the field offers substantial opportunities for specialization.

The curriculum for the bachelor's degree requires of all students a common foundation of work in the disciplines listed above. Students are then guided into advanced work in these areas and in their applications of courses in management and management science. Four degree programs are available for choice based upon the student's interest in specialized work. Each program emphasizes analytical tools, the scientific method and essential theory that will be useful in a rapidly changing world.

Financial Management

Professor and Head W. Gary Simpson, Ph.D.

The primary objective of the undergraduate curriculum is to develop a broad understanding and perspective of the financial aspects of man's activities, coupled with thorough training in the fundamental tools of financial analysis. Toward these ends, the development of elementary mathematical and statistical skills is highly desirable, as is complementary study in economics, accounting and business administration.

The major in finance is intended to prepare students for positions with organizations that require a special understanding of financial problems and financial systems. Students who major in finance are employed by organizations such as banks; the finance, accounting, or systems departments of business corporations; and other organizations that have need of financial expertise. Examples of topics covered in the finance program include financial management, investment theory, securities markets and financial institutions.
developing the careers of those employed. For those who enjoy working with both data and people, a career in personnel management offers many opportunities and the chance for personal growth and development.

Management Information Systems

The major in management information systems (MIS) prepares students for work in information systems development and maintenance. Both applications of computer systems technology and understanding of data and information flows among the functional areas of business are emphasized. The continuing integration of the computer in all aspects of business and the critical need for responsive management information systems has created a strong demand for graduates who are knowledgeable about both information systems and business. The first two years of study involve the study of mathematics, statistics, and computer science as well as English, accounting, economics, psychology and other courses designed to develop a broad educational background. The junior and senior years focus on aspects of information systems and computer technology including mainframe and microcomputer programming languages, data base management, management information systems, systems analysis, data communication systems, and management science methods. Coverage of functional areas prepares MIS graduates to understand the information needs of complex business organizations for which information systems are developed.

Management Science and Computer Systems

The major in management science and computer systems is designed to prepare students for careers as staff managers in complex businesses or nonprofit organizations. There is a high demand for persons with advanced computer competency with a knowledge of business systems. Many students have a special interest in building concentrations in management systems and computer science. The management science and computer systems program is ideal for this purpose. Examples of topics covered include managerial decision theory, operations research, systems analysis, management information systems and operations management. The study of management science and computer topics may be combined with advanced work in related disciplines for those with appropriate interests. Management science and computer systems majors typically enter business or public organizations as management systems analysts, computer systems analysts, or management trainees. Many also undertake graduate study to further their professional education.

Graduate Programs

The Department of Management offers work leading to the Master of Business Administration and the Doctor of Philosophy in business administration degrees. The Master of Business Administration Degree. (See “Business Administration.”)

The Doctor of Philosophy Degree. The Ph.D. in business administration program through the Department of Management provides intensive study in management, management science and management information systems. It prepares the student for significant professional contributions in university teaching and research, or staff positions in business or government.

The program is quite flexible and individually structured to meet the needs and objectives of each candidate. Emphasis is placed on an astute understanding of analytical and theoretical foundations of the business environment and development of research capabilities in the area.

The student will select as his or her major area management/management science. Two minor areas are also to be selected. One of the minor areas must be in the College of Business Administration from the fields of accounting, economics, finance, or marketing. The second minor area may or may not be taken outside the College of Business Administration. As support for the major and minor fields of study, each student is required to attain graduate level competence in economic theory and quantitative methods.

As prerequisites to the program, all candidates are to have completed appropriate basic courses in calculus and statistics. Likewise, candidates are expected to have a basic competence in the major functional areas of business-accounting, finance, management, and marketing. Competence in the functional areas is usually assumed for candidates having recently completed an appropriate graduate course in each area through a program accredited by the American Assembly of Collegiate Schools of Business.

Competence in planning and executing research must be demonstrated in a dissertation. In addition, each candidate must pass a series of comprehensive qualifying examinations, both written and oral, and a separate, final oral examination on the dissertation itself. To enhance teaching skills, all Ph.D. students in residence are required to teach on a part-time basis for at least one semester while earning the degree.

Outstanding students with master's degrees in any field of study may apply. Applications for admission to the program are evaluated on the basis of (1) undergraduate and graduate grade point averages, (2) score on the Graduate Management Admissions Test, (3) a two- or three-page statement describing goals and academic interests, (4) three letters of recommendation, (5) evidence of research potential, and (6) a personal interview when feasible. It is the responsibility of each applicant to insure that all material related to the above criteria is received by the Department.

Marketing

Associate Professor and Interim Head
Raymond P. Fisk, D.B.A.

Marketing is an exciting field of study in which a wide variety of job opportunities exist. It is also an excellent foundation study for eventual movement to top management within an organization. Marketing is concerned with the identification of wants and needs by consumers and the development of products, distribution channels, price and communication methods to best satisfy those wants and needs. Our economic system is dependent on the ability of organizations to match resources with needs. As such, firms become more marketing-oriented every year.

A marketing graduate will likely be involved in performance and management of many different traditional areas of decision-making—sales, advertising, logistics and marketing research. In addition, one will frequently assist in product planning, developing marketing information systems and general management.

The effective marketing executive today must develop a perspective and capability that reflect a four-dimensional program of study: (1) a liberal education in the sciences, humanities, behavioral and social sciences, mathematics and communications; (2) an adequate knowledge of the major functional areas of business; (3) a high-level competency in marketing; and (4) study in a supportive field. Liberal education is emphasized during the freshman and sophomore years. The study of the functional areas of business begins in the sophomore year and continues into the junior year. During the junior and senior years, the focus is on marketing. In addition to the introductory course, which provides an overview of the field of marketing, the student will take courses in consumer behavior, promotion, sales management, marketing research, channels and marketing policy. While studying marketing, one typically selects courses in fields such as management finance, statistics, advertising/public relations and other fields to support a particular career choice within the marketing field.

Graduate Programs

The Department of Marketing offers work leading to the Master of Business Administration and the Doctor of Philosophy in business administration degrees. The Master of Business Administration Degree. (See "Business Administration.")

The Doctor of Philosophy Degree. The Ph.D. in business administration program through the Department of Marketing provides intensive study in marketing. It prepares the student for significant
professional contributions in university teaching and research, or staff positions in business or government.

The program is quite flexible and individually structured to meet the needs and objectives of each candidate. The program is designed to create scholars and researchers in the field of marketing. Highly student oriented, the program focuses on training individuals in current marketing theory and research techniques. Collaboration between students and faculty is strongly encouraged.

Program Content. The student will take fifteen hours of Ph.D. seminars in marketing. The student must also complete a nine-hour minor in another discipline, such as economics, management, sociology or psychology. As support for the major and minor fields of study, extensive course work (normally 18 credit hours) in the area of quantitative/research methodology is required. In addition, each student must attain graduate level competence in economic theory.

Each candidate must pass a series of comprehensive qualifying examinations, both written and oral, that address knowledge in the major and minor fields. A separate final oral examination will be held on the dissertation itself. To enhance teaching skills, all Ph.D. students who plan to teach in the United States are required to teach on a quarter-or half-time basis for at least one semester while earning the degree.

As prerequisites to the program, all candidates are to have completed appropriate basic courses in calculus and statistics. Likewise, candidates are expected to have a basic competence in the major functional areas of business: accounting, finance, operations management, organizational theory, economics, and marketing. Competence in the functional areas is usually assumed for candidates having recently completed an appropriate graduate course in each area in an M.B.A. program accredited by the American Assembly of Collegiate Schools of Business.

Application Procedure. Outstanding undergraduate or graduate students from any field of study may apply. For those with an M.B.A., the program will normally consist of two years of course work and one year (or more) of dissertation work. For those without a master's degree, the plan of study for the Ph.D. degree will typically allow for the granting of an M.B.A. prior to completion of the Ph.D. degree. The program normally takes four years to complete for those without a master's degree. Applications for admission to the program are evaluated on the basis of (1) undergraduate and graduate grade-point averages, (2) score on the Graduate Management Admissions Test or Graduate Record Examination, (3) a two- or three-page statement describing goals and academic interests, (4) three letters of recommendation, (5) evidence of research potential, and (6) a personal interview when feasible. It is the responsibility of each applicant to ensure that all material related to the above criteria is received by the Department of Marketing. Application forms and detailed explanation of the Ph.D. degree in business with a major field in marketing are available through the Department. Students considering this degree are encouraged to contact the coordinator of the Ph.D. program early in the application process.
The College of Education administratively includes the departments of Applied Behavioral Studies, Aviation and Space Education, Curriculum and Instruction, Educational Administration and Higher Education, and the School of Occupational and Adult Education. The College offers a wide range of undergraduate and graduate programs to prepare individuals for careers in teaching, administration or research in the professional field of education either in the common schools or in institutions of higher learning. Additionally, programs in adult education and technical education prepare individuals for careers as human resource development specialists in business, industry and agency settings. There are a variety of degrees within the College at the bachelor's, master's, specialist and doctoral levels (see the "Degrees Offered" section of the Catalog).

There are increasing opportunities in business, industry and in state and federal agencies for persons with unique preparation in the several education specialties who do not desire to teach in the schools. Individuals interested in a nonteaching major in education should contact the College of Education Office of Student Services for further information.

The College also provides academic preparation for a wide range of specialties:

School Service Personnel-Certification Areas

Administrator (elementary school principal)
Administrator (school superintendent)
Administrator (secondary school principal)
Library media specialist
School counselor (elementary and secondary)
School psychologist
School psychometrist

II. Teaching Specialties-Certification Areas

Elementary school certificate (K-8)
  Elementary education
  (Middle school math)
  (Middle school science)
  (Special education)

Elementary-secondary school certificate (K-12)
  Art
  Foreign language
  Physical education/health
  Reading specialist
  Special education
  (emotionally disturbed, learning disability and mental retardation)

Secondary school certificate (7-12)
  Business professions
  English
  Industrial technology
  Journalism
  Mathematics
  Marketing education
  Middle school math
  Middle school science
  Science
  Social studies
  Speech/Drama
  Technical education
  Trade and industrial education

III. Other Specialties-Noncertification Areas

Adult and continuing education
Aviation and space education
College teaching
Community counselor
Community education coordinator
Counseling psychology
Curriculum and teaching
Curriculum supervision
Educational research and evaluation
Educational technologies
Educational/instructional psychology
Gifted and talented
Higher education administration
  (junior college, 4-year college, and university)
Higher education counseling
Higher education student personnel
Human development
Human resources development
Instructional systems
Marriage and family therapy
Microcomputer applications
Occupational education administration
Rehabilitation counseling

Accreditation

All College of Education programs are accredited by the Oklahoma State Regents for Higher Education, the National Council Accreditation for Teacher Education (NCATE), the Oklahoma State Board of Education, and the North Central Association of Colleges. The M.S. degree program in Rehabilitation Counselor Education in the Department of Applied Behavioral Studies is accredited by the National Commission on Accrediting through the Council on Rehabilitation Education.

High School Preparation

Students are expected to satisfy the high school curriculum requirements as determined by the Oklahoma State Regents for Higher Education. It is recommended that the student be involved in clubs and organizations as well as have had some experiences working with children and/or youth depending on the chosen teaching field.

Admission Requirements

Freshman students are admitted to the College of Education consistent with criteria published for admission to the University. For continuing enrollment in good standing, the College of Education requires a minimum of a 2.50 GPA for admission to Teacher Education, student teaching, and graduation. This standard is consistent with state requirements for students in the state of Oklahoma who complete teacher education programs and seek licensure. All student grades are reviewed at the end of the spring semester to determine whether appropriate academic progress is being made.

For graduation with recommendation for Licensure/Certification the following are required: (1) a 2.50 overall GPA; (2) a 2.50 GPA in the Major Requirements; and (3) a 2.50 GPA in Professional Education Requirements. The student must earn grades of "C" or better in each course in both the Major Requirements and Professional Education Requirements, and must earn grades of "B" or better in all sections of student teaching for recommendation for Licensure/Certification.

Scholarships

The College of Education offers several scholarships for undergraduate and graduate students. The following are scholarships offered by the College of Education:

Ray E. Brown Memorial Scholarship
College of Education Special Leadership Award
Education Student Council Scholarship
Future Teachers Scholarship
Frank E. and Harriet E. Hedrick Scholarship
Ora A. Henderson Memorial Scholarship
Daniel and Mary L. Herd Memorial Scholarship
J. Andrew Holley Memorial Scholarship
John Leslie Lehew III Scholarship
Locke, Wright, Foster, and Cross Graduate Scholarship
Mable Marietta Macy-Oaks Memorial Art Scholarship
Leon L. Munson Memorial Scholarship
Percy W. Oaks, Sr. Memorial Art Scholarship

The College of Education
Outstanding Freshman Aviation Education Student Technical Education Alumni and Faculty Scholarship
James Vandergrift Scholarship
Amy Louise Wagner Memorial Scholarship
Hoyt E. Walkup Scholarship

In addition to these scholarships, Oklahoma State University is allocated, on an annual basis, a large number of Oklahoma State Regents for Higher Education scholarships. These scholarships are available in teaching fields identified by the State Board of Education as critical shortage areas and are only available to Oklahoma residents attending or desiring to attend OSU. Nominations from OSU for the Regents’ scholarships will be based upon established criteria which include a concise written statement of career goals, academic performance, and an interview with the Scholarship Nomination Committee. Those applicants scoring highest on all criteria will be nominated to the Oklahoma State Regents for Higher Education. Recipients of the scholarships are expected to teach in the major field of preparation at least one year for each year of scholarship support.

Academic Advising

Academic advisement for undergraduate students is coordinated through the Office of Student Academic Services, 102 Gundersen, in the College of Education. Students with fewer than 28 earned semester hours are advised by academic counselors in the Office of Student Academic Services. Students with 28 or more earned semester hours are assigned to a particular academic adviser, in the Office of Student Services or to the faculty in the academic departments, based on the student’s declared major. Faculty academic advisers are nominated by their department heads and appointed by the dean of the College. Academic advisers may confer with their advisees on such matters as vocational counseling, course selection, academic problems, long-range professional goals and semester by semester enrollment.

Special Academic Programs

The College of Education utilizes the Bachelor of University Studies degree program along with the other colleges in the University. Unique career objectives can be met by working with academic advisers in selecting a specially-tailored program which ultimately leads to a degree.

General Education Requirements

All undergraduate degrees in the College of Education require a minimum of 50 semester hours in general education which includes the following: communication skills, mathematics, United States history and government, science, behavioral studies, arts and humanities, and electives. All degrees are consistent with the University General Education requirements and the Oklahoma State Department of Education standards.

Lower-division Requirements

Degrees in the College of Education contain essentially 60 semester hours which are in the area of general studies and the major. In addition to lower-division requirements, the College is consistent with the other colleges in the University by requiring at least 40 semester hours of upper-division course work.

Departmental Clubs and Honor Societies

Collegiate Distributive Education Clubs of America Education Student Council Kappa Delta Pi (education honor society) Student Art Education Association Student Council for Exceptional Children Student Education Association Technology Education Collegiate Association

Applied Behavioral Studies

Professor and Head Dale R. Fuqua, Ph.D.

The Department of Applied Behavioral Studies in the College of Education serves the University Teacher Education program and offers degree programs at both the undergraduate and graduate levels. Areas included in the Department are special education, counseling and student personnel, educational psychology and educational research and evaluation. A primary mission of the Department is to apply knowledge derived from psychological and related behavioral studies to the provision of educational and social services.

The Bachelor of Science Degree. Two undergraduate degree programs leading to careers in special education are available. In the Department of Applied Behavioral Studies, the undergraduate student can work toward a Bachelor of Science in Special Education, which includes an option in mental retardation. A joint undergraduate program is also available through the departments of Applied Behavioral Studies and Curriculum and Instruction. This joint program provides the student an opportunity to combine elementary education, mental retardation, and either learning disabilities or emotional disturbance in a five-year program.

Special Education Programs

Graduate Programs

Special Education Programs. M.S. Programs. Master’s level emphasis is available through the M.S. in Applied Behavioral Studies. The academic preparation program in the special education area includes special techniques and arrangements to facilitate the education of exceptional individuals. At the master’s level, students may pursue sub-area emphases in learning disabilities, emotionally disturbed, mentally retarded, gifted/talented, and general special education.

Ph.D. Programs. Doctoral level emphasis in special education is available through the Ph.D. in Applied Behavioral Studies. Graduates of this program pursue careers in university teaching and in the administration of special education programs in public and private settings.

Counseling and Student Personnel Programs. M.S. Programs. The counseling and student personnel area includes the following comprehensive specializations leading to master’s degrees: community counseling, marriage and family therapy, school counseling (elementary and secondary), and student personnel. The M.S. program in community counseling is intended for individuals who wish to serve as professional counselors in a variety of human service rehabilitation and community mental health agencies. Students may choose elective courses in selected areas of specialization such as youth counseling, substance abuse counseling, mental health counseling and rehabilitation.

The M.S. program in marriage and family therapy is an inter-departmental effort of the Department of Applied Behavioral Studies and the Department of Family Relations and Child Development. This program is designed to provide those who are beginning careers in marital and family therapy with the basic knowledge, skills, and professional identity essential to the practice of marital and family therapy at the entry level.

The M.S. program at the doctoral level is intended for individuals who wish to provide counseling services to children, youth, and consulting services to their teachers and parents in the school setting. The programs meet academic requirements for state certification as a school counselor. The M.S. programs are designed to meet academic requirements for licensure in professional counseling. Applications for all M.S. programs are due and will be reviewed March 1, June 1 and October 1.

The M.S. in student personnel services prepares students for entry level positions in service delivery and administration in colleges and universities. This program offers practical experience in various student personnel areas to enhance the student’s professional development.

Ed.D. Programs. The Ed.D. degree in counseling and student personnel is available with a specialization in either counseling and development or student personnel administration. These programs are designed to meet accreditation standards of the Council on Accreditation for Counseling and Related Educational Programs (CACREP).

The Ed.D. in counseling and development is intended to prepare individuals to function in counseling positions in public schools, junior colleges, vocational-technical schools, college and university counseling centers, mental health and a vari-
quality of community agencies. In addition, individuals may prepare to teach in counselor education programs in colleges or universities. A minimum of a 36-week counseling internship is required.

Students in the Ed.D. in student personnel administration are prepared to administer a student personnel program at institutions of higher education. The curriculum is sufficiently flexible to permit individuals to develop an area of expertise, such as training and development, organizational behavior, or computer applications. A minimum of a 36-week student personnel administration internship is required.

Ph.D. Programs. The Ph.D. degree offers specializations in counseling psychology, counseling and development, and student personnel administration. The didactic and experiential components of the counseling and development and student personnel administration programs are similar to those in the Ed.D. degree. The 105-graduate-credit-hour Ph.D. degree however, is designed to meet the needs of practicing professionals who have a strong interest in research. The counseling psychology program leads to the Ph.D. degree in applied behavioral studies and provides counseling psychology program leads to the Ph.D. degree in applied behavioral science and in counseling as a specialty. The program is organized to meet the accreditation standards of the American Psychological Association. The program is designed to prepare students for counseling, teaching, and research roles in various settings such as university counseling services and academic departments, child guidance centers, youth serv- ices, community mental health clinics, rehabilitation centers, and family services. Students are required to follow a specified sequence of study in which academic course work and practicum experiences are integrated. Students must complete a one-year full-time internship (or a two-year half-time internship). Applications for all doctoral programs are due by February 1 for the following fall enrollment.

Educational Psychology Programs. M.S. Programs. A master’s degree is available through the M.S. in applied behavioral studies with one of three emphases: general educational psychology, instructional systems, or school psychometry. The general educational psychology emphasis focuses on the application of psychological theory and research to the field of education. It is built around courses in learning, instructional psychology, and human development. The instructional systems emphasis introduces individuals to instructional systems design and prepares them for entry placement in applied settings. Suggested courses include program evaluation, instructional systems, and learning theory. The school psychometry emphasis prepares individuals to provide psychometric services to schools, youth agencies and other organizations working with children and youth. The school psychometry program may include state certification requirements.

Ph.D. Programs. A doctorate in educational psychology is available through the Ph.D. in applied behavioral studies. The role of educational psychology is to bring together basic behavioral research to serve the practice of education. Although educational psychology is part of the science of psychology, generally an effective scientist-practitioner must draw from all behavioral studies to meet the needs of society today. Students in the program will complete a set of core courses in educational psychology and will also complete course work in one of three areas of specialization: instructional systems, school psychology, or teaching and research in educational psychology.

The instructional systems specialization provides the individual with a broad set of knowledge and skills which support the analysis, development, evaluation, and implementation of instructional systems. This specialization prepares the individual for careers in areas such as human resource development, instructional technology, and training program development.

The school psychology specialization prepares individuals to be effective school psychologists. Course work focuses on skills and knowledge necessary for state certification and licensure. School psychology certification requirements may be met by completing a psychology master’s degree and a 30-hour course sequence. The Ph.D. program includes the requirements for state licensure.

The teaching and research in educational psychology emphasis is designed to prepare the graduate for the traditional academic roles of teacher and researcher. Within this emphasis, students might focus on one (or a combination) of the following areas: instructional psychology, human development, education of gifted and talented.

Research and Evaluation Programs. M.S. Program. The M.S. degree in applied behavioral studies provides master’s level study in educational research and evaluation. The academic preparation program in the educational research and evaluation area includes courses focusing on research and evaluation. The academic preparation program in the educational research and evaluation area includes courses focusing on research and evaluation and provides a basic graduate level preparation in applied educational research and evaluation. This program is designed to include advanced graduate training in two collateral areas, one of which must be in an area of education. The student may select the second collateral area in an adjunct field that provides course work conducive to the development of skills in educational research and evaluation. The second collateral area might be focused in an area such as curriculum evaluation, mathematical statistics, computer science, or program administration. A required practicum/internship provides an opportunity for practical applications of skills developed during the doctoral program. Graduates of this program will be prepared for positions such as college or university faculty members or directors of education, government agencies, private test corporations, or education foundations.

Aviation and Space Education

Professor and Head Kenneth E. Wiggins, Ed.D.

Aviation Education

The aviation education program offers both flight training courses and aviation theory courses for academic credit. The Department is administered by the College of Education; however, it serves students from all colleges of the University in meeting their aviation needs.

The program consists of basic and advanced aviation theory courses, aviation management, aviation safety, aviation law, and flight training which prepares individuals to qualify for certificates as private pilots, commercial pilots with instrument ratings, flight instructors and multi-engine ratings. In addition to the aviation courses, the program includes courses in natural science, business, management and liberal arts. The courses in aviation theory are conducted on campus; the laboratory portion of flight instruction is conducted at the Stillwater Municipal Airport in cooperation with approved flight program operators. Flight training is conducted under Federal Air Regulation Part 141.

Flight training and theory courses in aviation offer a number of valuable benefits. The private pilot can utilize the airplane for business or pleasure. In jobs where executive travel is required, the ability to pilot an airplane can definitely increase one’s potential. The commercial pilot can choose a career in various kinds of challenging and rewarding piloting jobs including flight instructor, corporate pilot, charter pilot, or agriculture pilot. These jobs can be used to gain experience and necessary flying hours to become an airline pilot.

Space Science Education

A major responsibility of the Office of Space Science in the Department of Aviation and Space Education is the coordination of the Aerospace Education Service Project. Oklahoma State University, under contract to the National Aeronautics and Space Administration (NASA), provides aerospace education specialists and support staff for the delivery of educational visits to public schools throughout the nation. In addition to school pro-
grams, the specialists also conduct teacher workshops, and work with professional organizations and civic groups. The specialists are often involved in the production and delivery of television and radio programs.

The Office of Space Science also serves regional teachers with in-service programs as well as serving as a resource center for reference and printed materials, videotapes, films, and slides pertinent to NASA’s research in aviation and space sciences. On-campus space science education includes resource support for existing pre-service education for teachers.

The Department of Aviation and Space Education also provides technical support and personnel talent for the delivery of space-related information via satellite. The videoconferences are interactive, with the opportunity for the student-teacher audience to pose questions to the program presenters. The programs usually involve a live feed from a NASA research center coupled with a broadcast from the OSU Educational Television facility.

Curriculum and Instruction

Professor and Head Douglas B. Aichele, Ed.D.

The Department of Curriculum and Instruction offers bachelor’s, master’s, specialist and doctoral degrees. Through its programs, it is directly involved in the education and certification of teachers and specialists in several instructional/professional areas. Specific areas of emphasis include preparation of elementary and secondary teachers, reading specialists, instructional media and technology specialists, and supervisors/curriculum coordinators.

Completion of the Bachelor of Science degree in Elementary Education qualifies the student for an elementary Oklahoma license (K-8). This program of study includes course work in general education, in a field of specialization, and in professional education motivated by substantial field-based practicum experiences.

The Bachelor of Science in Secondary Education degree is available in the following discipline areas: English, foreign language, journalism, mathematics, science, social studies and speech/drama. Completion of this program emphasizing one of these areas qualifies the student for a secondary (7-12) Oklahoma license. Students specializing in art, foreign language, or physical education/health also receive a degree in secondary education and qualify for an elementary (K-6) Oklahoma license. Each of these secondary degree programs includes general education courses, extensive specialization course work in the discipline area, and professional education courses motivated by substantial field-based practicum experiences.

Programs leading to an Oklahoma license as a curriculum administrator, reading specialist and as an audiovisual specialist are also available through the Department.

In addition to these degree/certification offerings, the department sponsors the Reading and Mathematics Learning Center jointly with the Education Extension office. This clinic provides a valuable service to the community as well as opportunities for research and practicum experiences for graduate students and faculty members.

The Department also sponsors the Microcomputer Technology Instructional Laboratory, the Reading and Mathematics Learning Center, and the Natural Resources and Environmental Education Center.

Graduate Programs

The Department of Curriculum and Instruction offers graduate degree programs at the master’s, specialist and doctoral levels. While specialization is required, maximum program flexibility enables students to meet their individual goals. These degree programs are designed to prepare persons to enter public or private elementary and secondary schools as teachers, curriculum directors, department heads, directors of learning resource centers, reading coordinators, team leaders, and research specialists. In addition, they prepare persons to serve in colleges and universities where they become methods instructors and/or researchers in the discipline-related areas of education.

The Master of Science Degree. A student may earn the degree of Master of Science (M.S.) in curriculum and instruction with emphasis in curriculum/ supervisory, elementary education, information/communication technology, reading, and secondary education. Within these degree emphases, a student can further specialize in such areas as art, curriculum/instruction, early childhood education, foreign language, language arts, mathematics, science, social studies, fine arts, and special education. Students planning an emphasis in secondary education must incorporate graduate course work from an academic discipline.

The master’s degree program is also frequently designed to qualify persons for an OSU recommendation for state licensure in a specific area. In addition to state licensure in those programs listed above, course work leading to an OSU recommendation for state licensure in school administration may be incorporated into a master’s degree program.

Course work leading to the Master of Science degree in curriculum and instruction with emphasis in curriculum/supervision, elementary education, information/communication technology, or reading is available through the University Center at Tulsa (UCT). OSU course work taken through UCT qualifies as residence credit course work.

In completing the master’s degree, students elect one of the following options:

Plan I (30 hours)-The student completes a minimum of 24 credit hours of approved course work and writes a master’s thesis for which six semester hours of credit are granted.

Plan II (32 hours)-The student completes a minimum of 36 credit hours of approved course work and writes a master’s report for which two semester hours of credit are granted.

Plan III (36 hours)-The student completes a minimum of 36 credit hours of approved course work which includes a creative component. The creative component must be explicitly identified on the plan of study.

Unqualified admission to the master’s degree program is granted to a graduate of an accredited college or university who has made application to the Graduate College (described under “General Regulations” in the “Graduate College” section who has achieved an acceptable grade-point average, i.e., a grade-point average of at least (1) 3.00 for all undergraduate course work; or, (2) 3.25 for all undergraduate upper-division and graduate course work; or, (3) 3.50 for OSU graduate course work included in the initial nine hours of study.

Provisional admission to the master’s degree program is granted to a graduate of an accredited college or university who has been admitted to the Graduate College and who has achieved a grade-point average less than the minimum required for unqualified admission but at least (1) 2.60 for all undergraduate course work; and, (2) 2.80 for all undergraduate upper-division and graduate course work, or, 3.00 for OSU graduate course work included in the initial nine hours of study.

Provisional admission is granted for a minimum enrollment in six credit hours of CIED course work to be determined through advisement and taken during one calendar year. A student admitted provisionally must earn a grade-point average of at least 3.50 in this course work to be admitted (unqualified). Dismissal from the program at the end of this probationary period is automatic if the student fails to satisfy this stipulation.

Further information about this degree may be found in the departmental publication Master’s Degree Policies and Regulations available in 302 Gundersen Hall and under “Master’s Degree” of the “Graduate College” section of the Catalog.

The Specialist in Education Degree. A student may earn the degree of Specialist in Education (Ed.S.) in curriculum and instruction with emphasis in curriculum/supervision, elementary education, information/communication technology, reading, and secondary education. Students emphasizing secondary education must incorporate graduate course work from an academic discipline. This degree program is designed for teachers in public schools two-year and four-year colleges, and universities. The Specialist in Education degree requires a minimum of 60 semester hours beyond the bachelor’s degree.

Unqualified admission to the Ed.S. degree program is granted to a graduate of an accredited college or university who has made application to the Graduate College and who has (1) submitted
The Doctor of Education Degree. A student may earn the degree of Doctor of Education (Ed.D.) in curriculum and instruction with emphasis in curriculum/supervision, elementary education, information/communication technology, reading and secondary education. Within these degree emphases, a student can further specialize in such areas as curriculum/instruction, early childhood education, language arts, mathematics, science and social studies. Students planning to emphasize secondary education must incorporate graduate coursework from an academic discipline.

The Doctor of Education degree requires a minimum of 90 semester hours beyond the bachelor's degree.

Unqualified admission to the doctoral degree program is granted to a graduate of an accredited college or university who has made application to the Graduate College and who has (1) submitted the completed departmental folder which includes a score on the Miller Analogies Test and other pertinent information, (2) provided evidence of at least one year of experience in a professional position in an education institution if not the holder of a master's degree, (3) received favorable recommendations from area faculty members who have evaluated the personnel folder, and (4) identified qualified faculty members who have agreed to serve on the advisory committee and in the chairpersonship role.

Further information about this degree may be found under "Doctor of Education" in the "Graduate College" section of the Catalog.

The Colloquium Series. Many opportunities exist for graduate students to become involved in ongoing departmental research projects and activities while studying in residence at Oklahoma State University. In particular, graduate students are expected to participate in the Colloquium Series sponsored by the Department.

Educational Administration and Higher Education

Professor and Head Thomas A. Karman, Ph.D.

Graduate Programs

Advanced graduate work is offered at the master's, specialist, and doctoral degree levels. Higher education degree programs prepare persons for careers as faculty members and/or administrators in colleges, universities, and other educational agencies. Public school educational administration degree programs and educational administration non-degree certificate programs prepare persons for positions in federal and state education agencies, for leadership careers as elementary or secondary principals and as school superintendents, and for staff positions in central offices and attendance centers. Students in educational administration may also develop competence in community education for positions in local school districts, community colleges, and state departments of education.

The educational administration program at Oklahoma State University focuses on developing professional educational leaders at both the public school and the higher education levels and stresses: (1) a thorough foundation in administrative theory; (2) a multidisciplinary approach to understanding the administrative process, including contributions from industrial management, political science, economics and organizational sociology; (3) extensive consideration of administrative functions and problems unique to particular educational levels; and (4) the preparation of leaders who can establish, develop, and maintain programs of community education.

The college teaching program focuses on developing skilled college and university instructors and stresses the combination of high-level competence in the appropriate subject area with the study of those facets of higher education which are important to functioning effectively in contemporary college and university settings. Persons interested in the college teaching program should contact the head of the Department for further information about specific cooperative arrangements with teaching fields. The higher education component includes the study of (1) the development of American higher education; (2) the roles, functions, and problems associated with various types of institutions of higher learning; (3) the essentials of curriculum development; and (4) the principles and procedures underlying effective college and university instruction.

Prerequisites. Educational administration majors are expected to have a minimum of 16 semester credit hours of undergraduate study in education. Higher education college teaching majors are expected to have an undergraduate major in the discipline they plan to teach at the college level.

Admission Requirements. Persons interested in degree or certificate programs should apply through the Graduate College. All applicants must submit transcripts of prior academic work. In addition, those persons seeking admission to a graduate degree program must submit a Graduate Record Examination score at the time of application. Once granted provisional admission to the Graduate College, and within the first four weeks of the initial term of study, all degree program applicants are expected to provide the Department with specific information that is used by the faculty to reach a decision regarding admission to a degree program. Since applicants are not considered for admission to the doctoral program until they are enrolled in, or have completed, the seminar EAHED 6930, "Educational Ideas," they should enroll in that course during their first term. When a person is admitted to the program, a permanent adviser and an advisory committee are appointed. The committee, working closely with the student, develops an individual plan of study. Prior to the appointment of a permanent adviser, the department head serves as a temporary adviser.

The Master of Science Degree. A student may earn the degree of Master of Science (M.S.) under one of three plans:

Plan I (30 hours)-the student completes a minimum of 24 credit hours of approved course work and writes a thesis for which six hours of credit are granted;

Plan II (32 hours)-the student completes a minimum of 30 credit hours of approved course work and writes a master's report for two hours of credit;

Plan III (32 hours)-the student completes a minimum of 32 credit hours of approved course work, which includes a creative component (e.g., a special report, an annotated bibliography, a project in research or design). The creative component must be explicitly identified on the plan of study.

After completing the plan of study, master's students in all departmental programs write a comprehensive examination.

Further information about this degree may be found under "Master's Degree" in the "Graduate College" section of the Catalog.

The Specialist in Education Degree. The student may earn the degree of Specialist in Education (Ed.S.) in educational administration or in higher education. The degree is designed for teachers and administrators in public schools, colleges, and universities. The specialist program in higher education offers a unique opportunity for persons preparing to serve the junior or community college. The Specialist in Education program requires a minimum of 60 semester hours beyond the bachelor's degree. Further information about this degree may be found under "Specialist in Education" in the "Graduate College" section of the Catalog.

The Doctor of Education Degree. The program in educational administration focuses on the development of education leaders for the public schools. It employs a multidisciplinary approach to administrative processes, incorporating knowledge from industrial management, political
science, economics, organizational sociology, and other fields as well as from education.

Programs in higher education focus on the preparation of administrators and faculty. The administrator preparation program utilizes knowledge from many fields of administration and allows the student to make appropriate application to higher education. The program for two- and four-year college teachers stresses an interdisciplinary approach and allows the student to develop strong competence in an academic area. The professional education component emphasizes the philosophies, roles, functions, and problems of various types of institutions of higher learning and incorporates the latest findings in curriculum development and effective college teaching. Cooperative programs for the college teaching degree have been developed in conjunction with many departments on campus. The Doctor of Education programs require a minimum of 90 credit hours beyond the bachelor's degree.

Further information about this degree may be found under "Doctor of Education" in the "Graduate College" section of the Catalog.

Graduate Programs

The School of Occupational and Adult Education offers graduate programs leading to the Master of Science degree in the specific areas of educational technology education, marketing education, technical education and trade and industrial education, as well as the general area of occupational and adult education. The School offers programs leading to the Specialist in Adult and Doctor of Education degree to prepare individuals for leadership roles in the broad areas of occupational and adult education. At the Ed.S. and Ed.D. levels, individuals may specialize in administration, curriculum and teaching, teacher education, or educational research, as each relates to the total field of occupational and adult education. Additionally, both degrees offer an emphasis in adult and continuing education or human resource development. Admission to any of these graduate programs requires a degree in an appropriate field with a high scholastic standing and the normal requirements of the Graduate College. In all cases, applications are considered on an individual basis and only a limited number of candidates will be accepted. For additional requirements, see "Prerequisites" under each program.

Business Education

Business education teachers continue to find excellent employment opportunities in secondary schools, area vocational-technical schools, and post-secondary schools. Society's move toward a service economy will further expand opportunities for vocationally-trained teachers in this field. Persons seeking certification in the field of business education will complete the teacher certification and bachelor's degree programs in the College of Education with specialized education courses being taken in the School of OAED under the BUSPR (Business Professions) and OAE prefixes. Additionally, the student will complete course work in the College of Business Administration related to specific subject areas to be taught.

Graduate Programs

Graduate program opportunities for the business educator are available as an area of emphasis under OAED's Master of Science and Doctor of Education degrees. Specialized work in BUSPR is available to be included in the candidate's degree plan.

Industrial Technology Education

Teaching in industrial technology is a fascinating career which permits one to help others to prepare for living in today's technological society. It is currently one of the areas that is experiencing a severe shortage of certified teachers in public schools. Industrial technology education is a comprehensive, action-based instructional program concerned with technology-its evolution, utilization, and significance; and with industry-its organization, personnel, systems, techniques, resources, and products and their social and cultural impact.

The industrial technology education curriculum is designed to prepare teachers for industrial arts and technology education classes in the public schools, grades 7-12. The program is divided into General Education, Professional Education and specialized industrial technology education. Specialized courses are designed to develop teaching competency for middle-school and high school exploratory programs in each of four areas: construction, manufacturing, communication and power and energy.

In developing technical competencies for an area of additional specialization or supporting areas, the student may select from courses taught in engineering technology.

Graduate Programs

The industrial technology education curriculum for the M.S. degree is planned specifically for those desire a greater degree of expertise in industrial
technology education and for those who are teaching in industrial arts or technology education in the middle, junior, and high school levels. The curriculum content is directed toward helping individuals to develop a higher level of competence in both instructional and technical skills in order to improve their classroom teaching effectiveness.

Prerequisites. Sixteen semester credit hours of undergraduate industrial technology education coursework and approval of an adviser are necessary.

Marketing Education.

Emphasis upon vocational training in the field of marketing has received greater emphasis in recent years because of the importance of the marketing function to the economic growth of the country. If the marketing function fails to achieve maximum efficiency, the U.S. will fall short of reaching full economic potential.

The demand for qualified vocational marketing education teachers across the country exceeds the supply. Marketing educators earn above-average salaries because of the nature of the training program and the emphasis being placed in society on the importance of vocational preparation. The recent emphasis on career education has indeed dramatized the need for vocational educators in all fields.

A marketing education major will complete core requirements in business administration, including courses in marketing, management, business law and business finance. Additional specializations may include courses in promotional strategy, consumer behavior, administrative communication, marketing research, advertising copy and layout, and merchandise display essentials.

Graduate Programs

The marketing education curriculum for the M.S. degree is designed for individuals who are preparing for employment in comprehensive high schools, area vocational technical schools, businesses, and junior colleges. The goal of this graduate curriculum is to help individuals develop higher-level competencies in both instructional and occupational skills in the distributive and marketing education fields.

Prerequisites. An undergraduate degree in marketing education or a related field is necessary.

Occupational and Adult Education

Graduate Programs

The M.S., Ed.S., and Ed.D. programs in occupational and adult education are intended for individuals who wish to prepare for broader educational roles relating to all vocational education disciplines, adult and continuing education, and employee development and training. Major program concentrations are available in adult and continuing education, human resource development, and vo-tec education. The emphasis in human resource development prepares trainers, training managers, human resource executives, and related personnel in business, industry, government, military, health care service agencies, and other environments to improve organizational performance by improving human performance. The emphasis in adult and continuing education prepares teachers and administrators in public schools, vocational-technical schools, community/junior colleges, universities, medical, correctional, and religious organizations as well as volunteers to facilitate effective learning for continuing education and returning adult students.

These degree programs are a cooperative, interdisciplinary effort among all Graduate Faculty of the School of Occupational and Adult Education with substantial contribution from Graduate Faculty members in other departments on campus.

Prerequisites. An undergraduate degree in an appropriate field, together with academic qualification indicative of potential success at the graduate level, are necessary. Experience related to the degree sought is desirable, but not necessary, except in the vocational-technical education emphasis.

Technical Education

The technical education curriculum is designed to prepare instructional personnel for technical programs of community junior colleges, technical institutes and industry. Graduates from this program also accept technical employment of various types in business, industry and government. The program includes an option which will provide the student with the academic requirements necessary for certification to teach in area vocational-technical schools.

The Bachelor of Science in Technical Education degree is designed primarily for graduates of technical programs in technical institutes and community junior colleges. Qualifying students from professional programs also are accepted into the program with advanced standing. In addition, students desiring to prepare for careers in this field may enter the program directly from high school and complete their technical major requirements at OSU.

Graduate Programs

The technical education curriculum for the M.S. degree is offered for persons who are preparing for employment in junior/community college or technical institute technician education programs and for those who aspire to positions in training programs for employee development. The overriding goal of this graduate curriculum is to help individuals improve their instructional and occupational skills for greater effectiveness in the educational setting.

Prerequisites. An adequate background in a major field of technology with an undergraduate program which includes specialized technical course work at the junior or senior level at an accredited college or university, and approval of an adviser are necessary.

Trade and Industrial Education

The trade and industrial curriculum is designed to prepare teachers, supervisors and coordinators for vocational trade and industrial education classes. Programs leading to the bachelor’s and master’s degrees are offered for those who wish to qualify for teaching under the approved state plan for vocational education as well as industrial training opportunities.

Students completing the degree program will be qualified to teach in the vocational departments of high schools and area vocational schools, or to be employed in industry.

The student’s area of specialization is selected from the industrial fields of air-conditioning, heating and refrigeration, auto mechanics, bricklaying, cabinetmaking, carpentry, commercial art, cosmetology, diesel engines, drafting, electricity, electronics, interdisciplinary cooperative education, machine shop, photography, printing, plumbing, sheet metal, small engines, tailoring, upholstery, welding and other industrial fields. The specific field is determined by the trade proficiency and teaching aspirations of the student. Since trade competency normally is required for admission to the program, students are accepted into this field of study only by consent of the program faculty. The required trade competency may be acquired by completing a vocational trade program in an approved high school or junior college, or by apprenticeship training, by actual experience in the field of specialization, or a combination of these.

Graduate Programs

The trade and industrial education curriculum for the M.S. degree is designed for instructors of a wide variety of trade areas in comprehensive high schools, in industries, and in area vocational and technical schools. The curriculum helps students build and increase competence in instructional, occupational, and supervisory skills for advancement opportunities in trade and industrial instructional situations whether in the public or private sector of trade and industrial education.

Prerequisites. Educational preparation in a specialized trade area and adequate occupational experience to meet minimum provisions of the State Plan for Vocational Education, and approval by adviser are necessary.

Teacher Education Programs

Officers of the Teacher Education Council

Kenneth L. King, Chairman and Executive Secretary
N. Jo Campbell, Faculty Chairwoman

Early Childhood/Elementary Education Faculty Group
Vernon E. Troxel, Chairman

Secondary Education Faculty Group
Deke Johnson, Chairman

Elementary-Secondary Faculty Group
Sandra Gangstead, Chairwoman

All Teacher Education programs are coordinated by the director of teacher education through the Office of Teacher Education, 101 Gundersen Hall. Upon completion of an approved program, passing the appropriate curriculum examination(s), and upon the recommendation of the University, the candidate will be eligible for licensure/ certification to serve in the schools of Oklahoma. All candidates completing an approved program or applying for teaching license since February 1, 1982, are subject to all rules and regulations specified by the Oklahoma Teacher Reform Bill of 1980.

Programs are offered at various levels, but all
Criteria for Admission to Undergraduate Teacher Education Programs

The criteria for admission to undergraduate Teacher Education programs are based on University-wide policies recommended to the director of teacher education by the Council on Teacher Education. Requirements are applicable to all teacher certification programs of the colleges preparing teachers. The student is not considered a fully qualified participant in a Teacher Education program until he or she has been formally admitted to Teacher Education.

Declaration of Intention to Pursue a Program in Teacher Education

During the first semester of the academic program, the student must complete the Declaration of Intention to Pursue a Program in Teacher Education. This form can be obtained in the College's Office of Student Services or in the office of the department head if the student is enrolled in the Teacher Education program in the colleges of Agriculture, Arts and Sciences, or Home Economics.

Provisional Admission to Teacher Education

The form Retention Data Part I: Provisional Admission should be completed as well as the following: scheduling of the Teacher Education Interview; registration for the National Teachers Examination (NTE) Communications Skills Test; and submission of ACT scores (English, math, science and social studies) and/or grades in these four areas.

The NTE Communications Skills Test measures listening, reading, English grammar and essay skills. Information and registration for the (NTE) Communications Skills Test can be obtained from the University Testing and Evaluation Service, 109 North Murray Hall. A study guide for the test is available in the Reserve Room in the Library. To prepare for the listening portion of the test, a cassette tape and study guide are available in the Non-Clock Room in the Library.

After Provisional Admission to Teacher Education, the student may elect to enroll in course work in the following preprofessional education areas (which must be completed before student teaching):

- Sociological foundations;
- Exceptional child;
- Human development;
- Laboratory and clinical experiences (45-clock hour minimum);
- Media.

Full Admission to Undergraduate Teacher Education

The student should complete Part II: Full Admission to Teacher Education and meet the following criteria:

1. ACT Scores. The student must achieve a score of 18 or above in each area (English, mathematics, science and social studies) on the ACT, or achieve the current state average for college-bound high school seniors ( whichever is higher), or must have earned a cumulative GPA of 2.00 in the area(s) at the time of admission to Teacher Education. If not, additional courses or retakes must be completed in the area(s) until a GPA of 2.00 is achieved.

2. National Teachers Examination (NTE)-Communications Skills Test. This test is required of all Teacher Education students and is composed of reading, written essay and grammar, and listening. If a student does not achieve the established national average of 658, the adviser in consultation with the student will suggest remedial course work. The student will retake the Communication Skills Test when recommended by the adviser.

3. Interview for Admission to Teacher Education. All candidates for full admission to undergraduate Teacher Education must be formally interviewed by a committee selected from the OSU Teacher Education faculty.

4. Orientation to Teacher Education and Laboratory and Clinical Experiences. An appropriate orientation to Teacher Education course work and clinical experiences (45-clock hour) must be completed with a grade of "C" or better grade of "P".

5. Minimum Cumulative GPA of 2.50. A minimum cumulative GPA of 2.50 must be earned, is based on no fewer than 40 credit hours of courses which are expected to include lower-division general education requirements as specified in the student's program. For students not seeking certification, see "Grading/public for Graduation" in the "Academic Regulations" section of the Catalog.

A student may not be permitted to enroll in the remaining courses in the professional sequence if full admission to the Teacher Education program has not been granted. Minimum GPA requirements may vary from this requirement due to state guidelines. Students should apply for full admission to Teacher Education as soon as possible. This usually occurs no later than the end of the second semester of the sophomore year.

Transfer students must work toward meeting the criteria for full admission to Teacher Education established by Oklahoma State University as soon as possible during the first semester at OSU.

Appeals

Pertaining to the appeals process is available through the Office of Teacher Education. Information on Teacher Education is described in the Guidelines of the Council on Teacher Education. Information pertaining to the appeals process is available through the Office of Teacher Education, located in Gundersen Hall, Room 101.

Retention in Undergraduate Teacher Education

For continuing acceptability and recommendation for a license or certification, the student must maintain all specified requirements for admission to the undergraduate Teacher Education program.

Application for Student Teaching Placement

The application for Student Teaching Placement must be completed by the student during the semester prior to the time of student teaching. The applications are distributed at a meeting called by the Coordinator of Clinical Experiences and through the Office of Teacher Education. Students are notified of this meeting through consultation with advisers.
through the O’Collegian, signs on bulletin boards across campus and in residence halls, and by announcements made in teacher education classes. Students must submit their Student Teaching Profiles to the Office of Teacher Education prior to specified dates in November and March. These dates will be announced to students in the same manner as mentioned above. Students will be notified in writing of their placements as soon as the coordinator of clinical experiences has received confirmation from the cooperating schools.

Criteria for Student Teaching for all majors in Teacher Education are:

1. Must have achieved full admission to a Teacher Education program;
2. Must have achieved an overall grade-point average of at least 2.50;
3. Must have a grade-point average of at least 2.50 in courses listed on the current approved program for licensure/certification in the areas of professional and major requirements. No grade lower than a “C” will be accepted in either of these areas;
4. In determining grade-point averages for admission to teacher education, only the last grade is considered for repeated courses (exact repeats, not substitutions);
5. All pre-professional education course work must be complete and must include at least one course in sociological foundations, early laboratory and clinical experiences, exceptions, and human development, with no grade lower than “C” accepted in any of these courses.

Out-of-Area/Out-of-State Placements. In extenuating circumstances, a student requesting an out-of-area/out-of-state placement must have the approval of the coordinator of Clinical Experiences and the department program coordinator, and will be required to pay the following fees:

1. All necessary and appropriate fees required in securing and finalizing the placement (e.g., reimbursement for cooperating teacher, supervisory service, etc.). These fees are payable to the Office of Teacher Education at least one month prior to the beginning of the semester in which the placement is sought.
2. If a recommendation for licensure/certification is to be made by Oklahoma State University, the student will be responsible for reimbursing OSU for at least one visit by an OSU supervisor in addition to the visitations performed by the cooperating institution. The student must achieve grades of “B” or better in all sections of student teaching in order to be recommended for a license and a standard certificate upon completion of the program. A grade of “C” in any section of student teaching will result in a recommendation for provisional certification after the licensure period and upon completion of the program. A student assigned the grade of “D” or lower in any section of student teaching will not qualify for a recommendation for a license or any level of certification.

Oklahoma Certification Testing Program

All students who graduate from a Teacher Education program after January, 1982, are required to complete the Oklahoma Teacher Certification Test(s) in his or her teaching field(s) with a score of “70” or above before a license can be issued. The examinations are administered by the state of Oklahoma four times each year. Registration booklets are available in the Office of Teacher Education, 101 Gundersen Hall. To qualify to take the Examination(s) the student must:

1. be fully admitted to Teacher Education;
2. have 90 hours of college credit completed on his or her transcript; and
3. meet minimum requirements for the standard teaching certificate and endorsements teaching. Minimum requirements as presented by the State Department of Education.

Personnel in the Office of Teacher Education will process and deliver the registration form and required fees to the Oklahoma State Department of Education.

Copies of the Objectives and Study Guides for the Oklahoma Teacher Certification Test(s) have been placed in the library, listed as Objectives for Oklahoma Certification Testing Program.

Any person who graduated from an accredited college of education prior to February 1, 1982, and seeks certification or endorsement to teach a subject area which the teacher was not certified to teach following completion of the necessary college credit hours, shall be required to pass the curriculum examination for such subject area prior to receiving such certification or endorsement.

An Oklahoma State University student must pass the Oklahoma Curriculum Examination in his or her major teaching area(s) before taking any tests in endorsement areas outside the major.

Recommendations for License and Certification

Oklahoma State University will not make a recommendation for a license or any level of teaching certificate until all criteria have been met that pertain to the approved Teacher Education program and a passing score has been achieved on the Curriculum Examination. Applications for an Oklahoma license or certificate can be obtained in the Office of Teacher Certification, 101 Gundersen Hall.

Entry-year Assistance Program

A candidate with a license will serve at least one, and in some cases two years, as an entry-year teacher under the guidance of an Entry-year Assistance Committee consisting of a teacher consultant, an administrator of the local district, and a higher education instructor. Upon completion of the entry-year teaching experience (120-180 days) the candidate may be recommended either for certification by the Entry-year Assistance Committee or for an additional year of teaching under the guidance of a new Entry-year Assistance Committee. If the candidate does not complete the second year as an entry-year teacher satisfactorily, the Entry-year Assistance Committee will recommend noncertification for the candidate.

Graduate Programs

Post-bachelor’s certification programs are offered in the undergraduate program areas listed previously. In addition, post-bachelor’s certification programs are available for library media specialists, school counselors, school psychologists, and in special education-emotionally disturbed and learning disabilities. Master’s degrees are available in virtually all of the above programs and doctorates are available in many. Areas of concentration in several of these fields may be included as part of a master’s degree program if approved by the department head and the dean of the Graduate College.

Post-master’s level certification programs are available for: (1) elementary school principal; (2) school superintendent; (3) secondary school principal; (4) school psychologist; and (5) school counselor.

Inquiries concerning any aspect of Teacher Education programs at Oklahoma State University should be addressed to the head of the department offering the program or the Office of Teacher Education.

Admission to Graduate (Post-baccalaureate) Teacher Education Programs. Graduate (post-baccalaureate) students must file the form Declaration of Intention to Pursue a Teacher Education Program-Post-Baccalaureate and meet one of the following criteria for full admission to Teacher Education:

1. The student must have completed an approved Teacher Education program and hold a valid Oklahoma license or Provisional, Standard, or Professional Certificate; or
2. Students in a master’s program must (a) satisfy the departmental requirements for unqualified admission to the master’s degree program; (b) have a minimum overall GPA of at least 2.50; (c) pass the National Teacher Examination (NTE) Communications Skills Test; (d) complete the NTE Teacher Education; and (e) complete at least one semester hour of laboratory and clinical experiences (45-clock hours minimum) and an orientation to Teacher Education course with a grade of “C” or better or a grade of “P;” or
3. Students classified by the Graduate College as "special" or provisionally admitted must (a) have a minimum GPA of at least 2.50; (b) have either a standard score of 18 in each area of the ACT (English, math, science, and social studies) or a minimum GPA of 2.00 on the transcript in English, math, science, and social studies. (If not, additional courses or retakes must be completed in the deficient area(s) until a 2.00 GPA is achieved; (c) pass the National Teachers Examination (NTE) Communication Skills Test; (d) complete the Interview to Teacher Education; and (e) complete at least one semester hour of laboratory and clinical experiences (45-clock hours minimum) and an orientation to Teacher Education course with a grade of “C” or better or a grade of “P.”

The student must apply for and be granted full admission to the Teacher Education program prior to enrolling in student teaching methods and the student teaching internship. A student may not be permitted to enroll in the remaining courses in the professional sequence if full admission to the Teacher Education program has not been earned. Certain vocational programs may vary from this requirement due to state guidelines. Students should apply for full admission to Teacher Education as soon as possible.

Appeals. Decisions regarding admission/retention in Teacher Education are described in the Guidelines for the Undergraduate Teacher Education Program. Information pertaining to the appeals process is available through the Office of Teacher Education, 101 Gundersen Hall.

Graduate Teacher Education. For continued acceptability and recommendation for a license or certification, the student must maintain all specified minimum requirements for the undergraduate Teacher Education program.
The professionals and semi-professionals who will be largely responsible for the shape of the world in the year 2000 and beyond are just starting their higher education. The power they will exercise makes an exciting prospect and presents a sobering responsibility. Many of the easy problems that are usually solved first are now a part of history. Many difficult problems remain. The need for well-qualified and well-trained people is obvious; one will be embarking on a lifetime of challenge if he or she decides to prepare for a career in engineering, engineering technology or architecture while at Oklahoma State University.

Most of the work of engineers, technologists and architects is concerned with the perception, design and fabrication of devices and installations, and processes and systems that serve human needs. This work provides ample opportunity to express creativity. It requires an ability to make decisions.

Engineers and architects, working side by side and supported by technologists, constitute one of the most powerful agents for change in our society. New ways are found to control the environment, to utilize the resources and forces of nature, to increase productivity of needed goods, and services, in short to improve the quality of life for all.

The College of Engineering, Architecture and Technology (CEAT) offers a complete spectrum of educational opportunities designed to give graduates the capability and the flexibility to meet the ever-changing requirements of society—a society heavily committed to technological innovation. To be prepared to make continuing contributions, engineers, architects and technologists must have at their command not only the modern tools and processes of industry, but a firm and rigorous education in mathematics and the physical sciences. In order that those contributions be sensitive to genuine human needs, the engineer, architect or technologist must also be schooled in the social sciences and humanities that provide the understanding of non-technical factors that must shape technological innovation.

The curricula are continuously evolving to assist the student first to master the enduring principles upon which future practice will be based, and second to acquaint him or her with current applications of these principles. With such a bridge built between theory and practice, the educational experience will support one's following diverse interests and opportunities throughout the productive years of his or her life span.

Accreditation

The following undergraduate engineering programs are separately accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET):

- Architectural engineering
- Agricultural engineering
- Chemical engineering
- Civil engineering
- Electrical engineering
- General engineering
- Industrial engineering and management
- Mechanical engineering
- Mechanical engineering (aerospace option)

The following undergraduate engineering technology programs are separately accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology:

- Construction management technology
- Electronics technology
- Fire protection and safety technology
- Manufacturing technology
- Mechanical design technology
- Mechanical power technology
- Petroleum technology

The following programs in architecture are accredited by the National Architectural Accrediting Board:

- Bachelor of architecture
- Master of architecture

The Engineering Curricula

The traditional four-year bachelor's degree programs in engineering remain available at OSU. However, in order to meet the ever-changing and complex needs of a technological society, one who expects to enjoy a lasting and successful career in the practice of engineering should obtain a background in mathematics, the basic sciences and in engineering that cannot readily be acquired in four years. To meet this primary objective of an engineering education, the Schools of Engineering encourage every qualified student to pursue a curriculum leading to a master's degree over a period of approximately five years, even though it is expected that there will be many entry-level job opportunities available for the graduate with the bachelor's degree. Furthermore, the bachelor's program in engineering is an excellent preparation for professional training in law or medicine, since it provides a student with maximum flexibility in career choices.

Academic Programs

Academic programs offered in the College of Engineering, Architecture and Technology culminate in the following degrees:

Schools of Engineering:

- **Bachelor of Science** in Agricultural Engineering, Chemical Engineering (petroleum and pre-medical options), Civil Engineering, Electrical Engineering (computer engineering option), General Engineering, Industrial Engineering and Management, Mechanical Engineering (aerospace, petroleum and premedical options).
- **Master of Science** in agricultural engineering, engineering, chemical engineering, civil engineering, electrical engineering, environmental engineering, general engineering, industrial engineering and management, and mechanical engineering.

*Doctor of Philosophy* in agricultural engineering, chemical engineering, civil engineering, electrical engineering, general engineering, industrial engineering and management, and mechanical engineering.

Division of Engineering Technology:

- Bachelor of Science in Engineering Technology.

School of Architecture:

- Bachelor of Architecture, Bachelor of Architectural Engineering, Master of Architecture and Master of Architectural Engineering.

High School Preparation

Beginning students who have completed two units of algebra and one each in plane geometry,
and trigonometry/analysis in high school should be prepared to enter at the expected level in mathematics. In addition, it is recommended that students planning an engineering degree obtain high school credit in one unit of general chemistry, one unit of general physics as well as one-half unit of graphics, if available.

Oklahoma State University offers course work in algebra, trigonometry and preparatory chemistry for students who were unable to obtain this work during high school. However, such credit does not count toward the minimum number of semester hours specified for the B.S. degrees.

The selection of the initial chemistry and mathematics courses for an entering student in the College of Engineering, Architecture and Technology is determined by his or her score on placement tests administered at enrollment, the amount of mathematics or chemistry completed in his or her high school program and ACT test scores. When appropriate, students with a strong background can obtain academic credit by advanced standing examination or by College Level Examination Program (CLEP) tests.

The Professional School Concept

In accord with the professional nature of a career in engineering, students entering OSU are admitted into the pre-engineering program, consisting of the course work normally taken the first two years of an engineering curriculum. Near the completion of the pre-engineering course work, the student applies for admission to one of the professional schools of the College to continue in the upper-division program. Students meeting admission standards then pursue a two-year curriculum leading to the B.S. degree or a three-year curriculum leading to a master’s degree in their discipline.

Pre-engineering Program. The pre-engineering program is comparable to the freshman and sophomore levels in other disciplines. The content of the pre-engineering program is uniform for all engineering specialties except architectural engineering, and includes course work devoted to mathematics through calculus and differential equations, communication skills, general chemistry, general physics, the engineering sciences commonly referred to as mechanics, thermodynamics and electrical science, and the social sciences and humanities.

Admission Requirements

Admission to Pre-engineering. In order to maintain a high quality, the professional school concept for admission to the engineering and architecture programs is utilized. Students must first be admitted to the pre-engineering or pre-architecture program and complete certain minimum requirements as outlined under "Lower Division Requirements" in order to be considered for admission to a professional school and allowed to pursue the upper-division curriculum. Transfer students are normally first admitted to pre-engineering regardless of the number of hours completed but may be permitted to take selected upper-division courses prior to admission to a professional school as appropriate.

Oklahoma residents may be admitted to pre-engineering, pre-architecture or technology if they meet OSU admission requirements stated elsewhere in the Catalog.

Nonresident students applying for admission to pre-engineering as freshmen must meet the following requirements:

Make a composite standard score of 19 or higher on the ACT or a comparable score on a similar battery of standardized national exams. When it is not practical to take such exams (e.g. international students), the student’s high school grades should demonstrate comparable competency and the potential for success in an engineering major.

Nonresident freshmen not directly admissible to pre-engineering but those who meet OSU requirements for admission may be admitted to Freshman Programs and Services for one or two semesters in order to fully evaluate their qualifications for admission to pre-engineering. After grades are received each semester, such students will be evaluated and, if qualified, will be admitted to pre-engineering.

Minimum requirements for admission to pre-engineering from Freshman Programs and Services are:

1. an overall grade-point average (GPA) of 2.30, and
2. a GPA of at least 2.30 at OSU in mathematics, physical science and English courses applying toward the degree, and
3. ability to make satisfactory progress toward an engineering degree.

Nonresident transfer students will be admitted directly to pre-engineering if they meet the following requirements:

1. an overall GPA of at least 2.70 on a 4.00 scale, and
2. a GPA of at least 2.50 over all mathematics, physical science, engineering science and engineering courses, and
3. a GPA of at least 2.00 (in at least 12 hours if a full-time student) in the most recent semester completed, and
4. ability to make satisfactory progress toward an engineering degree.

International student applications must be received by June 15, November 1 and April 1 for the fall, spring and summer terms, respectively, to be considered for admission to pre-engineering.

All GPA’s are calculated using only the last grade in any repeated course.

The College of Engineering, Architecture and Technology, in implementing the policy for admission to engineering programs at Oklahoma State University, provides special consideration for members of U.S. minority populations, veterans, and educationally or economically disadvantaged citizens who show reasonable promise for successful completion of the undergraduate engineering curriculum requirements. All special admissions under these exceptions will be approved by the Office of the Dean of Engineering to ensure that the policy will not affect adversely the admission of students from minority backgrounds. Transfer students will not be admitted if in their most recent semester of transfer credit, their performance would have them on probation if enrolled at Oklahoma State University. Students transferring to pre-engineering from another major at OSU must meet the same requirements for admission as a student transferring from another college or university.

Admission to the Professional Schools. A student who will have completed, including his current enrollment, no fewer than 60 semester credit hours of study at an accredited institution of higher learning, and who has demonstrated satisfactory competence in the pre-engineering curriculum described above, is eligible to apply for admission to the professional school of his or her choice. The requirements for such admission are described in detail under "Lower-division Requirements."

In addition, if the number of qualified professional school applicants to a given professional school exceeds the number that can be provided a quality program with the resources available, the number admitted each semester to that professional school will be limited. In that event, priority for admission will be given first to Oklahoma resident pre-engineering students and second to the nonresident students in pre-engineering on a best qualified basis as determined by the grade-point average in courses taken and completed at OSU. This practice will preserve the high standards demanded of a quality educational experience sought by students and necessary so that OSU graduates will continue to be highly regarded.

A common prerequisite for any student to enroll in upper-division course work offered by the
professional schools of the College is competence equivalent to that required for admission to the schools, as described above. For students who have not been admitted to a professional school, competence will be evaluated on an individual basis by the head of the school or a designated representative.

**Master of Engineering**

The Master of (specific school) Engineering degree programs are designed to prepare the graduate for the practice of the engineering profession in industry and government. They are distinguished by particular emphasis on developing in students the ability to perform effectively in design and development work; the programs normally include internship experiences as a part of the academic process. Approximately one year of graduate study is taken at the culmination of these programs offered in the Schools of Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical and Computer Engineering, General Engineering, Industrial Engineering and Management, and Mechanical and Aerospace Engineering.

Admission to one of the programs depends upon being accepted by one of the professional schools in the College of Engineering, Architecture and Technology (CEAT). The programs consist of undergraduate work corresponding to the junior and senior level, and a 32-semester-credit-hour study program in graduate-professional status meeting Graduate College requirements for a Plan III master's degree.

Students may enter a professional school at any level for which they are qualified that exceeds the minimum requirements for eligibility for admission to a professional school. (See "Admission to Professional Schools.")

To be admitted to graduate-professional status in a professional school in the CEAT, a student must have completed a curriculum leading to a B.S. degree in engineering meeting the requirements of the Accreditation Board for Engineering and Technology. Students with B.S. degrees in physics, chemistry, etc., must complete work to meet ABET undergraduate requirements before gaining graduate-professional status. Scholaristic performance as an undergraduate at a level that indicates a high probability of success in a graduate program requiring a 3.00 minimum GPA on a 4.00 scale is also a requirement.

The 32 semester hours in graduate-professional status combine with 68 or more semester hours of upper-division work to total at least 100 semester hours beyond the pre-engineering level for the professional programs. This course work is taken in accordance with a professional school plan of study established for each student to meet the objectives of the program and the professional school in which he or she is enrolled. Three-year plans of study will include: 16 semester hours of required courses common to all engineering curricula; not fewer than 36 semester hours of additional engineering work specified by the particular professional school, and of these, at least 15 semester hours must be at the 5000 level, exclusive of professional practice; and six to eight hours of professional practice in the graduate year of the plan of study. The courses should be chosen at both undergraduate and graduate levels to meet ABET basic and advanced requirements for course work that is classified as design. (Currently, one-half year of engineering design is required in the basic, i.e., undergraduate programs, and an additional one-third year in the advanced portion.)

The professional school plan of study serves as the preliminary plan of study for the graduate portion of the program, but a separate final plan of study must be filed with the Graduate College by the end of the second week of the term during which all requirements for graduation are to be completed.

**Scholarships**

Several scholarships are funded through private donations, alumni gifts, and industries, and vary in amounts from $400 to $1,250 per year. These scholarships are available for freshman through senior students, and are awarded primarily on the basis of academic achievement and leadership potential. However, during the selection process consideration may be given to financial need and other factors. Freshman students should normally have an ACT composite score of 30 or higher and be in the top 10 percent of their high school graduating class to be competitive for CEAT scholarships.

Each school or department within the College normally has scholarship funds available. These are administered through that school or department rather than through the College's scholarship committee. However, a separate application form is not required.

Application forms and information regarding CEAT may be obtained by contacting the Office of Student Academic Services, CEAT, EN 101, OSU, Stillwater, OK 74078.

**Freshman scholarship applications** must be completed and on file by March 1 preceding the academic year for which the student expects to receive the scholarship. Applications should be submitted to the Office of Student Academic Services.

**Continuing and transfer students** should submit applications to the professional school in which they are majoring prior to May 1. In this manner they will also be considered for any departmental scholarships for which they may be eligible as well as for any CEAT scholarship. Students who have not selected a major should submit their applications to the Office of Student Academic Services.

**Academic Advising**

The College’s Office of Student Academic Services provides advisement for all pre-engineering students and pre-architecture students. (Consult the heading “Division of Engineering Technology” for specific information regarding advisement for students in technology programs.) When a student has gained admission to a professional school of engineering or architecture, he or she will be assigned a faculty adviser.

Each student is personally advised in the planning and scheduling of his or her course work and is counseled and advised individually on matters of career choice, his or her activities at OSU, and on other academic matters. An academic file is created for each student at the time of initial enrollment.

**Progress Toward a Degree**

Full-time students are expected to complete twelve or more semester credit hours each term with a grade-point average of 2.00 or above to make satisfactory progress toward a degree. Should either the hours completed or grade-point average for any term fall below the minimum, the student may be placed on academic probation.

**Probation and Suspension**

1. Students in the CEAT will be placed on probation at the end of any academic term in which they fail below the criteria for satisfactory progress toward their degree objectives.
   a. The conditions for satisfactory progress in an academic term are:
      1. at least a 2.00 GPA, and
      2. at least 24 grade points (12 in a summer term) for a full-time student in courses which apply toward the degree objective. Part-time students must make at least a 2.00 GPA.
   b. Students placed on probation following the fall semester will be subject to suspension following the spring semester. Probation terms are set on an individual basis but normally required of full-time students.
   c. Students placed on probation following the spring or summer terms will be subject to suspension in the fall semester only.

2. A student will be subject to suspension at the end of any term in which he or she fails to meet...
University retention standards. (See “Academic Regulations” in the Catalog.

3. A student will not normally be suspended who is within 24 semester credit hours of graduation.

4. Students who have been reinstated will be suspended at the end of any semester in which they fail to meet probation requirements.

5. Students who have been suspended for both reasons of unsatisfactory progress toward the degree and of academic dishonesty will not be reinstated in the College of Engineering, Architecture, and Technology.

6. An effort will be made to appropriately advise students on probation of their academic status at the end of every academic term, but they are responsible for being aware of their academic status and for taking appropriate action.

7. Students on probation will be required to sign an acknowledgement of the terms of their probation. Students will be held subject to the terms of probation established by their advisers whether or not they see their advisers and sign the acknowledgement of the terms of probation.

8. Students on probation will not be allowed to enroll for the term following the end of the probationary period until grades are received verifying that probation requirements have been met.

Reinstatement

Any student who has been suspended from the University for academic reasons may apply for reinstatement by making application through the Office of Student Academic Services in the College in which the student wishes to be reinstated. Students in the CEAT should obtain a copy of CEAT reinstatement procedures to seek reinstatement.

A suspended student who is reinstated will return to school on academic probation and will be subject to the probation procedures above.

Concurrent Enrollment

A student expects to apply credits toward a degree at OSU that are to be earned at another institution or through correspondence or extension, while enrolled in one of the programs of the College of Engineering, Architecture and Technology, permission must be obtained in advance. It is the belief of the faculty of the College that such enrollment detracts from the educational process at this institution, and can be justified only in the most unusual circumstances. Normally, if the material for which such permission is sought is available at OSU, permission will not be granted, nor will retroactive permission be granted in any circumstances.

Calculators

An engineering, architecture or technology student is expected to be equipped with an appropriate calculator or computer. Any student not so equipped will be at a disadvantage in learning activities. Necessary functions include exponential functions, the logarithm and inverse logarithm functions in both natural base and base 10, and the trigonometric and inverse trigonometric functions.

Special Academic Programs

Co-op Program. The College of Engineering, Architecture and Technology offers an experience-based program, Cooperative Education (Co-op). Co-op allows engineering and technology students to achieve a balanced education through the combination of theoretical and practical knowledge during their early years of professional development. The student’s education is a cooperative effort between the University and industry. Students alternate semesters on campus with work semesters in industry during their junior and senior years. The periods of employment constitute an essential element in the educational process. Students gain practical knowledge which is carried back to the classroom, giving academic programs a sense of reality. By the time they receive their degrees, students have accumulated the equivalent of a year-and-a-half of progressively challenging work experience.

Participation in Co-op is voluntary; transfer students must successfully complete at least one semester at OSU prior to their first placement. Students may obtain further information about the program from the coordinator, Room 101A, Engineering North.

Engineering Honors Program. The Honors Program provides opportunities for challenging and individual study for undergraduate students of unusually high ability, motivation and initiative. Honors classes, seminars and independent study courses are structured to put interested students and teachers together in ways which encourage discussion and a mature approach to learning. Invitation to the program is extended only to approximately the top five percent of entering students.

Each honors course completed with an "A" or "B" grade is identified on the student's transcript as such. A special bachelor's degree Honors diploma is conferred upon graduation for successful completion of all Honors Program requirements.

Qualified high school scholars will be eligible for the Honors Program beginning with their first enrollment at OSU as freshmen. An ACT composite score of at least 30 is required for Engineering and Architecture Honors students and at least 26 for Technology Honors students.

All other OSU students and transfer students who are classified as freshmen (27 semester credit hours or fewer), and who have completed twelve more hours with a grade-point average of 3.50 or above are eligible to join the Honors Program regardless of their ACT scores.

Requirements for a Bachelors Degree with Honors. (1) A grade-point average of 3.50, both overall and in the major field. (2) A total of 12 semester credit hours with grades of "A" or "B" in honors sections of basic introductory-type courses from at least three of the following areas: English, a foreign language, mathematics or logic, social sciences, natural or physical sciences and humanities. (3) Honors credit with grades of "A" or "B" in a total of 12 semester hours of junior and senior courses within the student’s major field, including at least three hours of independent study. (4) Acquisition and submission of a formal application for the Honors degree within two weeks after the beginning of the final semester.

Job Placement. An employment service is provided for students in the College. This service is available to students interested in obtaining summer or permanent employment.

The Placement Office is coordinated with the University Placement Office and assists students in signing up for interviews with companies interviewing on campus. Lists of employment opportunities with companies not recruiting on campus are maintained at all times. Resources are available to assist the student seeking employment including company literature, resume information, interviewing tips and placement annuals.

Placement orientation sessions are held at the beginning of each semester to familiarize the students with the services provided.

Tutoring Program. A tutoring program is provided to assist students in their understanding of fundamental courses in mathematics, physics, chemistry and engineering science.

The sessions are held each fall and spring semester Monday through Thursday evenings. Each session lasts 30 minutes and the student is charged a nominal fee. Students may sign up for a maximum of one hour per evening if they wish.

Information about the program can be obtained in the Office of Student Academic Services.

General Education Requirements

The College of Engineering, Architecture and Technology urges its students to make maximum use of the course work required by the College and the schools for simultaneous fulfillment of many of the general education requirements.

Opportunities to satisfy General Education requirements with required courses in the schools of Engineering include:

English. Students are required to complete a course in technical report writing. Thus, students making an "A" or "B" in the first English composition course (ENGL 1133), need not take ENGL 1213, and may take the report writing course, ENGL 3323, to meet both the general education requirement for English and the College requirement.

Humanities and Social Science. Engineering students must complete a total of 16 semester credit hours to meet this requirement, which is in compliance with the minimum requirements stipulated by the Accreditation Board for Engineering and Technology. By taking American history and political science to meet general education requirements, three or four additional hours of social and
behavioral science, and six or seven hours of humanities, the 16 hours can meet the University’s requirements in these areas. Furthermore, if one of these courses is selected from those meeting the University’s requirements for an International Dimension, the total number of hours for the degree can be held to the minimum.

Basic Science and Mathematics. All students are required to complete 32 semester credit hours in these areas to meet college requirements. Eighteen of these credits can be used to meet University requirements in Natural Science and in Abstract and Quantitative Thought. The required chemistry and physics course work meet the University requirement for Scientific Investigation.

The total college requirements amount to 54 semester hours, well over the 40 hours required by the University for general education. However, no more than 18 of the 32 hours in mathematics and science can be counted toward General Education, and several hours of the course work are more advanced than what would normally be approved for General Education.

Opportunities for simultaneously meeting the requirements imposed by the School of Architecture and General Education requirements parallel those of the schools of Engineering with some variations. Specific courses, required in the Architecture curriculum, may be used to meet General Education requirements as follows: Urban Sociology (SOC 3423) can be used to meet the minimum requirements in Social and Behavioral Science, and Architecture and Society (ARCH 2003) can be used to satisfy three credit hours of General Education credit in the Humanities as well as the International Dimension requirement. At least 17 semester hours of basic science and mathematics can be counted toward General Education requirements, and required course work in "History and Theory of Architecture" can be used for General Education credit, except that at least one General Education course unrelated to the major must be included.

The pattern for meeting General Education requirements with course work also meeting departmental requirements is similar in the Division of Engineering Technology, but with some variations from department to department.

Required course work in mathematics and basic science is utilized to meet up to 18 semester hours of General Education requirements also. The Scientific Investigation requirement is met as a part of the course work meeting professional requirements for basic science.

Meeting the remaining General Education requirements is not influenced by departmental requirements. In each case, provision is made for an elective to complete the minimum 15 semester credit hours in course work not directly supportive of the major. These hours, and the required hours in the Humanities (H) and Social and Behavioral Studies (S) areas provide an opportunity for the student to also meet the International Dimension requirement without adding hours to the program.

Lower-division Requirements

In the Schools of Engineering and the School of Architecture the lower-division course work is devoted to qualifying for admission to the associated upper division; i.e., in each case continuing progress in the program is contingent on successful completion of lower-division course work measured against standards that are considerably higher than University retention standards.

Engineering. Admission to a professional school. A student is eligible to apply for admission to one of the professional schools of Engineering when the classes in which he or she is enrolled will bring his or her total semester credit hours of course work at an accredited institution of higher learning to at least 60 hours. Admission to the professional school is the demonstration of an acceptable level of competence in subject matter comparable to that covered in the General Education and Pre-Engineering components of the lower-division curriculum as described in detail in the publication, Undergraduate Programs and Requirements and acceptance by the appropriate professional school. The demonstration of competence is normally in the context of formal course work, but up to one half of the requirements may be completed by examination.

An acceptable level of competence for the purpose of admission to a professional school may be demonstrated by achieving all of the following:

1. Of the 60 or more semester credit hours, at least 51 shall be from the General Education and Pre-engineering courses specified for the degree. The minimum grade-point average in these 51 hours is 2.30, and final grades of "C" or better are required in each English, mathematics, physics, chemistry or engineering science/engineering course.

2. A minimum of 12 of the required semester hours must be completed at Oklahoma State University, with a grade-point average of 2.30 or better in these courses.

3. The overall grade-point average applicable to the mathematics, physics and chemistry courses, and those engineering science and engineering courses taken prior to admission to a professional school, should equal or exceed 2.50.

While 60 semester hours are specified for the common pre-engineering curriculum, in some cases, preliminary courses pertinent to an individual major are recommended to be taken in the sophomore year. When such courses are taken, it is understood that pre-engineering course work may be deferred to the junior year. Furthermore, individual schools may impose higher standards for admission. Consult the Undergraduate Programs and Requirements or the particular requirement sheet for these details.

Architectural. Admission to the upper division (third year) in the School of Architecture is granted to the most qualified applicants up to the capacity of the program. However, to be considered, a student must have completed 60 semester credit hours, all required architecture courses specified for the first two years with grades of "C" or better, and maintained an overall GPA of 2.30 or better. Furthermore, first preference will be given to students who have completed ARCH 2114 prior to admission.

Technology. The specific requirements for continuation beyond the lower division in the various majors in the Division of Technology are not uniform. Programs may have stipulations regarding admission to the upper division. Attention is directed to the requirement sheet for the appropriate major or the publication Undergraduate Programs and Requirements for the specific conditions a student must satisfy.

Departmental Clubs and Honor Societies

Alpha Epsilon (juniors & seniors in agricultural engineering)

Alpha Pi Mu (honor society for juniors & seniors in engineering)

Amateur Radio Club

American Institute of Architects

American Institute of Aeronautics & Aeronautics

American Institute of Chemical Engineers

American Society of Agricultural Engineers

American Society of Civil Engineers

American Society of Mechanical Engineers

CEAT Student Council

Chi Epsilon (civil, architectural or general engineering honor society)

Construction Management Society

Construction Specifications Institute

Engineering Ets (students in CEAT)

CEAT Student Council

Eta Kappa Nu (electrical engineering honor society)

Fire Protection Society

Institute of Electrical & Electronics Engineers

Institute of Industrial Engineers

Omega Chi Epsilon (chemical engineering students)

Pi Tau Sigma (mechanical and aerospace engineering honor society)

Society of Automotive Engineers

Society of Black Engineers, Technologists & Architects

Society of Electronic Electrical Power Technology

Society of Manufacturing Engineers

Society of Mine Engineers

Society of Petroleum Engineers

Society of Women Engineers

Tau Beta Pi (engineering students honor society)

Tau Iota Epsilon (technology students)

Pi Tau Sigma (mechanical and aerospace engineering honor society)

Society of Automotive Engineers

Society of Black Engineers, Technologists & Architects

Society of Electronic Electrical Power Technology

Society of Manufacturing Engineers

Society of Mine Engineers

Society of Petroleum Engineers

Society of Women Engineers

Tau Beta Pi (engineering students honor society)

Tau Iota Epsilon (technology students)

Agricultural Engineering

Professor and Head David R. Thompson, Ph.D.

Agricultural engineers are professional people who generate and adapt engineering knowledge.
and technologies for the efficient and effective production, processing, storage, handling and distribution of agricultural, food and other biological products, and the management of natural resources.

Agricultural engineering utilizes basic engineering expertise, but focuses this knowledge on the invention, design and management of biological systems. The opportunities for agricultural engineers are as diverse as flood control, equipment design for food production and processing, design and management of processing facilities, and environmental control for plants and animals. Agricultural engineers develop and utilize machine vision systems for quality control, expert systems for process and machine optimization, unique machines for efficient manufacture or production of food, forest products and other biological materials, and environmental control system for aquaculture, disease control or indoor plant production.

The problem-solving ability and broad-based engineering background of agricultural engineers make them well suited for activities such as research, development, design, production, management, technical sales and private consulting. The additional background in biological sciences provides graduates excellent opportunities for entering other professional schools, such as medicine, dentistry, veterinary medicine, biological sciences or agricultural programs. Many opportunities exist for international work in both developed and developing countries.

Agricultural engineering courses for juniors and seniors integrate the engineering sciences with agricultural and biological sciences and teach students to design solutions to real problems of society. Students work both as individuals and in teams to solve design problems provided by industrial firms who also hire agricultural engineering graduates. Students receive specialized design experiences in one or more of the following areas: hydrology and water resources, including flood control, irrigation, and water supply; machinery, instruments and controls for farming and ranching, food processing and packaging, and production of biotechnology products; and systems for efficient production, processing, handling and storage of agricultural and biological products.

Graduate Programs

The School of Agricultural Engineering offers three programs leading to post-baccalaureate degrees: Master of Agricultural Engineering, Master of Science and Doctor of Philosophy. The Master of Agricultural Engineering program places emphasis on design and internship in engineering experience to prepare the graduate for practice in the engineering profession.

Facilities for design and research are available in processing of agricultural products, plant and animal environment, energy in agriculture, microelectronics, light structures, agricultural power and machinery, pesticide application, soil and water resources development, irrigation, hydraulics, and hydrology.

Research projects are supported by the Agricultural Experiment Station. A well-trained faculty, many of them registered professional engineers with research, consulting and design experience, guide the graduate students' activities and help plan programs to meet the students' needs. Graduate students prepare designs and specifications for special equipment and facilities needed to carry out their work. They are expected to demonstrate by thesis and supporting research or by designs the ability to organize a design problem or an experimental investigation, carry it to completion and report the results.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation from an engineering curriculum accredited by the Accreditation Board for Engineering and Technology.

Admission to the Master of Agricultural Engineering degree program is permitted for students who meet the prerequisites as stated in the "Master of Engineering" section. The departmental graduate committee will evaluate the applicant's credentials to determine equivalency and specify requirements to overcome deficiencies. A student must be accepted by an adviser in the Department prior to official admission to the graduate program.

Degree Requirements. A candidate for any of the degrees listed above follows an approved plan of study which must satisfy at least the minimum University requirements for that particular degree.
Architectural engineering at OSU concentrates on the design of building structural systems to resist the various forces of nature, such as gravity, winds and earthquakes, as well as the forces of man. It involves the detailed study and use of materials such as steel, concrete and wood in applications as diverse as earth-sheltered structures, high-rise and long-span structures of the.

Architectural engineers practice in a wide variety of professional engineering settings such as consulting firms, architectural firms, industrial or commercial organizations and governmental agencies. The program's educational goal, as in architecture, is to provide the education necessary for leadership in the architectural engineering profession.

The demand for OSU graduates consistently exceeds the supply potential from the School. OSU graduates are sought by leading architectural and engineering firms both in Oklahoma and nationally.

Undergraduate Curriculum

The programs in architecture and architectural engineering are five years long and offer the professional degrees of Bachelor of Architecture and Bachelor of Architectural Engineering, which are required for professional licensure.

Undergraduate Admission. Students who satisfy the University admission requirements are eligible to enter for the first two years of the program. Upon completion of these two years, the best qualified students are selected, upon application, by the School for admission to the upper division. Admission is based upon academic achievement and professional potential. Admission criteria are subject to annual review by the School and may be obtained directly from the School.

Student Work. Projects submitted for regular class assignments may be retained by the School. All projects not retained will be available to the student.

Faculty and Facilities. In keeping with the professional orientation of the School, the faculty each have extensive experience as successful practicing architects and architectural engineers, as well as outstanding scholastic records. Faculty experience includes the design of virtually all building types and systems in the many varied climates of Europe and Asia, as well as North and South America.

The School of Architecture is housed in the Architecture Building, the original University Gymnasium and Armory, built in 1918. This structure was extensively remodeled in 1976 and contains all studios, laboratories, galleries and offices of the School. Specialized facilities include the Cunningham Resource Center, containing all of the University's holdings on architecture and a fully-equipped Computer-assisted Design Laboratory. The faculty and students are especially proud of the Architecture Building, for it serves as an example of innovative architectural design and the adaptive reuse of an important building.

Student Body. With the curriculum based upon extensive and personalized student-faculty interaction, the student-faculty ratio in studio courses is set at approximately 15 to one. Annual student enrollment is approximately 300 students of whom 22% are women and 18% are international students, thus providing a rich and diverse educational environment. A variety of student organizations and activities are available.

Graduate Programs

The School offers the opportunity for specialized study at the graduate level in architecture and architectural engineering. These programs lead to the post-professional degrees, Master of Architecture and Master of Architectural Engineering.

These graduate programs are designed for students already possessing their first professional or five-year degree. Each graduate program is normally one-year long and consists of a minimum of 32 credit hours.

Candidates with nonprofessional four-year undergraduate degrees may apply for admission to the professional degree program and, if admitted, complete the requirements for a Bachelor of Architecture degree. Application may then be made to the School's graduate program.

Graduate Admissions. Admission is limited and based upon undergraduate academic records and accomplishments, examples of work, practical experience and recommendations from practicing architects, engineers and educators.

Admission depends upon being accepted by the Graduate College of the University and by the School's Graduate Admissions Committee. Complete applications for admission must be filed with both the Graduate College and the School by February 15. The School's Graduate Admissions Committee will review all applications by March 31. Late applications will be considered only if vacancies exist. Normally, applications to the graduate program are considered for admission beginning the following fall semester only.

Student Portfolios. For the Master of Architecture program, photographic examples of work performed in architectural design and other professional courses or actual practice are to be submitted with the admissions application for review by the School. Slides are not acceptable. Portfolios should be mailed directly to the School to arrive no later than February 15. Candidates for admission to the Master of Architectural Engineering program are not required to submit a portfolio.

Regulations and Procedures. Regulations and procedures as established by the Graduate College for a master's degree apply to the School's graduate programs, except as otherwise noted in the School's current program description. This description is reviewed by the School annually, and may be obtained directly from the School.

For further information, contact the School of Architecture, Oklahoma State University, Stillwater, OK 74078-1085.

Chemical Engineering

Regents Professor and Head Robert L. Robinson, Jr., Ph.D., P.E.

Chemical engineers apply chemical, physical, and engineering principles to solve important problems and to supply vital materials for our technology-based civilization. Their work ranges from pharmaceuticals to fuels to industrial chemicals to bioengineering and to many others. It includes energy conservation and pollution control. The emphasis on chemistry and the chemical nature of everything we use is what makes chemical engineers different from other kinds of engineers.

Chemical engineers often find themselves defining a problem or product, developing a process to do what is needed, and then designing the plant to carry out the process. After the plant is started, chemical engineers will commonly manage operations, oversee equipment maintenance, and supervise control of product quality. They trouble-shoot the problems which hinder smooth operations, and they plan for future expansions or improvements. Their training and knowledge make them well qualified to market the products from a plant, the processing equipment for it, or even the complete plant itself.

![Chemical Engineering Image]
Graduate Programs

The School of Chemical Engineering offers three programs leading to post-baccalaureate degrees: the Master of Chemical Engineering degree, the Master of Science degree, and the Doctor of Philosophy degree.

A program of independent study and research on a project under the direction of a member of the Graduate Faculty will be satisfactorily completed by all graduate students. For the Master of Science candidate, the project may result in a thesis or report; for the Doctor of Philosophy candidate, the project will result in his or her dissertation.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree programs requires graduation from a chemical engineering curriculum approved by the American Institute of Chemical Engineers. Graduates from other curricula should submit transcripts to the head of the School of Chemical Engineering for evaluation.

Admission to the Master of Chemical Engineering degree program is permitted for students who have the minimum competencies as stated under "The Master of Engineering." Students may enter the program at any level for which they are qualified provided they are accepted by the School of Chemical Engineering.

The Master of Chemical Engineering Degree. This program involves one year study beyond the B.S. degree course work. A minimum of 32 semester credit hours is required to incorporate CHENG 5213, 5423, 5633, 5743, 5793, 5843, and six additional hours of approved graduate-level elective courses. Also, a professional internship is required which is represented by enrollment in CHENG 5030 for at least six semester credit hours. Two semester credit hours of CHENG 5990, Special Problems, are required.

This program is distinguished by the incorporation of an intern experience to give students real-time engineering practice, usually in an industrial environment under the guidance of an industrial preceptor as well as a University professor.

The Master of Science Degree. General requirements for the Master of Science degree in Chemical Engineering are 30 semester credit hours beyond the B.S. degree of course work and an acceptable thesis (a minimum of six hours of credit required for thesis research). The chemical engineering courses taken must include CHENG 5213, 5423, 5633, 5843, and 5743.

The Doctor of Philosophy Degree. The general credit requirement is a minimum of 90 semester credit hours beyond the B.S. degree including at least 12 hours of graduate study. The student must select a minor field with at least 12 hours of credit in this area. The chemical engineering courses must include CHENG 6023 or 6113, at least one other 6000-level CHENG course, and 12 hours of credit in other 5000- and 6000-level CHENG courses. Each student is responsible for consultation with his or her advisory committee in preparing the study plan.

Civil Engineering

Professor and Head Robert K. Hughes, Ph.D., P.E.

The exceptional diversity of professional practice in civil engineering presents many career opportunities for students well-founded in the physical sciences, mathematics, geology and biology. The concern of civil engineers is man's engineering-environmental control, alteration and utilization. Civil engineers engage in planning, designing and constructing highways, waterway and railway systems, harbors and shipping facilities, systems for the treatment and distribution of water and for the collection and treatment of sewage and industrial waste, dams and hydroelectric works, airports and terminals, structures of every kind including buildings, bridges, towers, industrial plants, aircraft, missiles, space vehicles, surface vehicles and submarines, tunnels and subway systems, schemes for the control of water and air pollution, and many other works of general benefit to the society.

The professional curriculum in civil engineering is based on the pre-engineering courses in mathematics, physical sciences and engineering sciences. On this foundation, required courses train the student in the basic skills needed for the professional practice of civil engineering and provide the tools for more advanced study. Engineering theory and principles are developed in a way that will encourage the student to solve the solution of practical problems. Elective courses give experience in the solution of typical problems and develop the judgement and confidence of the student engineer.

The purpose of the curriculum is to prepare the student for his or her professional career as a designer, office engineer, field engineer, contractor, engineer manager or manager. The graduate of this program will be well-prepared for work in engineering offices, city, state and federal governments and organizations, and the construction, chemical, petroleum and transportation industries.

Some degree of specialization is provided through the choice of elective courses in structures, engineering mechanics, transportation engineering, soil mechanics and foundations, construction engineering and management, environmental engineering and water resources. Strong support for various parts of the program are given by the departments of Industrial Engineering and Management, Mechanical and Aerospace Engineering, Agronomy, Business Administration, Chemistry, Geology, and Microbiology.

Graduate Programs

The School of Civil Engineering offers five programs leading to post-baccalaureate degrees: the Master of Civil Engineering degree, the Master of Environmental Engineering degree, the Master of Science degree in civil engineering, the Master of Science degree in environmental engineering, and the Doctor of Philosophy degree. The Master of Civil and Environmental Engineering degrees are graduate professional degrees with increased emphasis on professional practice through a broad spectrum of management, economic and technical studies and the incorporation of actual engineering design experience before graduation. The Master of Science degree, on the other hand, is characterized by a higher degree of technical specialization in a particular area of study. The Doctor of Philosophy degree is designed to prepare a student for research and for the teaching profession in engineering.

Major areas of study in the School are applied mechanics, structural analysis and design, transportation, construction engineering and management, geotechnical engineering, water resources, and environmental engineering. Research in all major fields is continuously pursued. Master of Civil Engineering candidates may choose to either specialize or to engage in a broadly based program of study, in accordance with an approved and purposeful plan of study.

Admission Requirements. Candidates for the Master of Science or Doctor of Philosophy degree must have graduated from a civil engineering curriculum accredited by the Accreditation Board for Engineering and Technology. Graduates from other curricula and schools should submit transcripts to the head of the School of Civil Engineering for evaluation. Admission to the Master of Environmental Engineering requires the completion of at least 100 semester credit hours beyond the minimum criteria stated for admission to the Professional School. This may include six semester credit hours of work beyond the minimum criteria stated for admission to the Professional School. This may include six semester credit hours for professional practice. Experienced engineers may substitute additional course work for professional practice.

The Master of Civil Engineering or Environmental Engineering degree requires the completion of at least 100 semester credit hours of work beyond the minimum criteria stated for admission to the Professional School. This may include six semester credit hours for professional practice. Experienced engineers may substitute additional course work for professional practice.

The Doctor of Philosophy in either Civil or Environmental Engineering requires the completion of at least 30 semester credit hours beyond the bachelor's degree, including a research thesis for which not more than six semester credit hours may be granted. The non-thesis option (32 semester credit hours) described in the "Graduate College" section may be permitted at the discretion of the student's advisor.

The Doctor of Philosophy degree requires the
Electrical and Computer Engineering

Professor and Head James Baker, Ph.D., P.E.

Electrical Engineering

The electrical engineering program provides the fundamentals for a career in many related areas. All around is seen the astounding impact of microelectronics on consumer products such as calculators, electronic watches, TV games, home computers and microwave ovens, but the future impact will be even more astounding on worldwide satellite communications, energy conservation, automation of industrial plants, oil and gas exploration, electrical power generation and distribution, to mention a few.

The undergraduate electrical and computer engineering program at Oklahoma State University prepares each graduate for a life-long professional career. During the first two years, students complete a carefully designed pre-engineering program consisting of mathematics, physical sciences, engineering sciences and selected courses in the humanities and social sciences.

During the final two years of the program, each student concentrates his or her study on electrical and computer engineering subjects and can elect from the following areas: computer engineering, electronics, energy systems, communications, control systems, electromagnetics, solid state devices and network theory/signal processing.

Computer Engineering

A special program option in computer engineering is offered by the School of Electrical and Computer Engineering. This option is designed for students who have a strong interest in computers and desire to gain a full understanding of both the electronic hardware and the programming software aspects of modern computer systems. A student in computer engineering will also gain a detailed knowledge of one or more applications where computers are being used as integral components of advanced engineering systems; examples are instrumentation and test facilities, communication systems, power systems and process control systems. Students in computer engineering will work directly with microprocessors, microcomputers, and minicomputers and develop special electronic circuits for interfacing these computers to various peripheral devices.

In addition to the laboratories devoted to research, separate instructional laboratories give students "hands-on" experience in microcomputers, minicomputers, digital logic design, electronics, electrical machinery, networks, instrumentation and electromagnetics. In most instances, the student is guided through laboratory exercises which are closely related to classroom lectures. Here the student has the opportunity to verify theoretical principles and design concepts presented in the lectures. In other courses, the laboratory formats are more open-ended, allowing the student to experiment freely and exercise individual discretion in discovering experimental results.

The School of Electrical and Computer Engineering offers a full range of undergraduate and graduate program options. A degree in electrical or computer engineering is also an excellent foundation for graduate work in other professional fields such as medicine and law. Many graduates also pursue advanced programs in business and management after earning a degree in engineering.

Graduate Programs

The School of Electrical and Computer Engineering offers three graduate degrees: Master of Electrical Engineering, Master of Science and Doctor of Philosophy. The Master of Electrical Engineering degree is designed to prepare the graduate for the practice of the engineering profession and is distinguished by the incorporation of an internship program to give students practical engineering design experience before graduation.

The Master of Science degree is designed for students interested in careers in industry and government service that emphasize advanced design, development, and research methods for high technology. This degree incorporates additional advanced coursework and on-campus creative activities.

The Doctor of Philosophy degree is designed to prepare the student for high-level research/development positions in industry and government and for the teaching profession in engineering and is distinguished by the emphasis on research and the incorporation of a doctoral thesis.

Students may select course work and participate in research and design projects in the following areas: computer engineering, energy systems, control theory, communications, electromagnetics, electronics, network theory, solid-state devices, artificial intelligence and parallel processing.

In addition, students may elect a multidisciplinary program that crosses departmental lines and emphasizes the application of electrical engineering and systems theory to complex problems involving the interaction of engineering systems and technology with social, economic and environmental processes.

Admission Requirements. Admission to the Graduate College, as described under "General Regulations" in the "Graduate College" section is the first step for those students proceeding toward advanced degrees. Graduation from an electrical engineering curriculum accredited by the Accreditation Board for Engineering and Technology with high scholastic performance qualifies the student for admission to the School of Electrical and Computer Engineering as a candidate for any of the three advanced degrees offered.

Graduates from non-engineering fields such as mathematics, physics and computer science are also admitted to Electrical Engineering M.S. and Ph.D. graduate programs if an evaluation of their transcripts indicates they are prepared to take graduate-level course work in electrical engineering, or can be expected to do so after a reasonable amount of remedial course work. This condition also applies to graduates of unaccredited engineering programs and engineering technology programs.

Admission to the Master of Electrical Engineering program is permitted for students who meet the minimum prerequisites as stated in the section on "Master of Engineering." Students may enter the program at any level for which they are qualified; they must at least meet the minimum admission criteria and be accepted by the School of Electrical and Computer Engineering.
Degree Requirements. The Master of Electrical Engineering degree is awarded to those who complete 32 hours of credit meeting Graduate College requirements for a Plan III master's degree program. The plan of study for this program must include at least 24 hours of course work, with more than half in electrical engineering at the 5000 level or above, and six to eight hours of credit for the internship practice. Flexibility is permitted in selecting courses to achieve specific program objectives. The Master of Science degree is awarded to those students who successfully complete an approved plan of study under one of two possible options. If a thesis is written, 30 semester credit hours are required, including six hours credit for the thesis. If no thesis is written, 32 semester credit hours are required, including two hours credit for a creative activity. To be approved, a plan of study will include, as a minimum, 18 hours of 5000-level courses in electrical and computer engineering. Most plans of study include additional 5000-level courses, depending upon the background and particular educational goals of the student, and the minimum stated above is allowed only when a specific interdisciplinary plan of study is approved by the faculty. Each student is encouraged to include courses in supporting disciplines such as mathematics, computer science, statistics, business, and other engineering fields. In certain cases, remedial work in undergraduate electrical and computer engineering will be required in addition to the 30-32 hours specified above.

The Doctor of Philosophy degree is granted in recognition of high achievement in scholarship in course work selected from the broad field of electrical engineering, and an independent investigation of a research problem in a chosen field of specialization that leads to a contribution to knowledge, as presented in a dissertation. For this degree the Graduate College requires a minimum of 90 credit hours for acceptable academic work beyond the bachelor's degree, including credit for the dissertation.

General Engineering

Professor and Head Bennett L. Basore, Sc.D., P.E.

For the student with interests that do not conform to any one of the traditional engineering disciplines, OSU offers a structured interdisciplinary program that continues the breadth developed in all engineering students in the engineering sciences course work, and has considerable depth.

General engineering embodies the fundamentals of four major engineering disciplines (civil, electrical, industrial, and mechanical), to develop in basic science and engineering fundamentals regardless of the context in which these concepts are applied.

As a professional with an interdisciplinary background, the general engineer is prepared to analyze, design and synthesize solutions in a technically expedient manner under one of two permissive options, the economics of design or process, as well as the humanistic requirements for utilization and operation. The student may choose to follow a professional practice within one of the four disciplines; he or she may look to a career in research and development, particularly of an interdisciplinary nature; he or she may choose the avenues of development in professional consultation or individual proprietorship; or finally, because of his or her background and perspective, he or she may choose a career in the management circles of government or industry.

The resources of the College, both faculty and laboratory facilities, are available to the general engineering student who pursues course work alongside majors in each of their traditional disciplines.

Because the general engineer can expect to be called upon to perform at a professional level in any or all of the disciplines covered by the curriculum, each student is encouraged to plan a program leading to a master's degree, which will assure a more competitive level of competence in all four of the engineering disciplines.

Graduate Programs

The School of General Engineering offers three programs leading to post baccalaureate degrees: the Master of General Engineering degree, the Master of Science degree in general engineering, and the Doctor of Philosophy degree. The Master of General Engineering degree is distinguished by its increased emphasis on professional practice and design through a broad spectrum of technical, management and economic studies and the incorporation of an internship program to provide actual engineering experience before graduation. The Master of Science degree is characterized by a higher degree of technical specialization. The Doctor of Philosophy degree is a research-oriented degree designed to prepare the candidate for a career in teaching or research.

Major areas of study in general engineering follow the undergraduate pattern of combining course work from civil, electrical, industrial and mechanical engineering. Research is pursued with the option of limiting studies to one of the cooperating areas or of combining the areas.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree program requires graduation preferably from an engineering curriculum accredited by the Accreditation Board for Engineering and Technology. Graduates from unaccredited engineering curricula or from curricula in chemistry, physics, and mathematics should submit transcripts to the head of the School of General Engineering for evaluation.

Admission to the Master of General Engineering degree program is permitted for students who meet the minimum prerequisites stated in "Master of Engineering." A student may enter the program at any level for which he or she is qualified provided the minimum admission criteria have been met and the student has been accepted by the head of the School of General Engineering.

Degree Requirements. An approved plan of study is developed for each student. All programs are characterized by the flexibility available in a study plan that is designed to satisfy the particular needs of the student, while conforming to the general requirements for the degree as specified by the University and as implied by the title of the degree.

The Master of General Engineering degree requires about three years of study beyond the pre-engineering requirements and involves not fewer than 98 semester credit hours of course work including an internship program. The plan of study for the graduate professional (third) year should include three semester credit hours of mathematics or statistics and probability; eight semester credit hours of internship/professional practice; and 12 semester credit hours in an area of interest; and three semester credit hours of human sciences. At least 32 semester credit hours must be included in the graduate professional study plan, and of these, 12 or more semester credit hours must be in design, as defined by the Accreditation Board for Engineering and Technology, and 21 semester credit hours shall be in 5000-level courses or above. Any remaining course work may consist of specified courses to meet the objectives of the student and the curriculum.

The Master of Science degree program is based on an integrated plan of study with a specific objective for each candidate. The Master of Science degree requires the completion of approximately 30 semester credit hours beyond the bachelor's degree including a research thesis of six semester credit hours. Students from disciplines other than general engineering will be required to follow study plans designed to produce the breadth expected of a general engineer, and will require 32 semester credit hours if no thesis is pursued.

The Doctor of Philosophy degree in general engineering requires the completion of not fewer than 90 semester credit hours beyond the bachelor's degree, including credit for a research dissertation. In the plan of study, the mathematics and technical engineering courses are directed toward and support the proposed area of research. Emphasis may be placed on two or more areas of concentration which support the research and dissertation. The ideal plan of study should generally include: 12-18 credit hours of mathematics above the bachelor's degree or bachelor's certification, six credit hours of human sciences, and 18-24 credit hours of research. The semester credit hours remaining to complete the plan of study should be selected to satisfy all requirements of the Graduate College, and to supplement the student's academic background. The overall plan of study is subject to the approval of the advisory committee.
Industrial Engineering and Management

Professor and Head Carl B. Estes, Ph.D., P.E.

Industrial engineering is one of the five major engineering disciplines and is concerned with designing, analyzing and operating a wide range of systems that include people, materials, money and equipment. Industrial engineering is the only engineering discipline which is specifically concerned with the role of the human being in the processes by which goods and services are produced and as such is often called the “people-oriented engineering discipline.”

Productivity and effective utilization of resources, including energy and hazardous materials management, are principal concerns of practicing industrial engineers. The industrial engineer may follow a career in almost any type of enterprise; manufacturing companies, service organizations such as insurance companies, banks and hospitals, and government agencies, including city, state and federal government functions. The industrial engineer’s position in an organization is usually as a management adviser in contact with every phase of the organization. Because of the breadth of his or her background, the industrial engineer is especially well qualified to rise to positions of leadership and authority within the organization.

The curriculum blends a basic group of common engineering science courses with specialized courses in the major areas of industrial engineering-design of human/machine systems, design of management control systems and improvement of operations (both manufacturing and service). The course offerings stress mathematical and statistical techniques of industrial systems analysis, quantitative methodologies of operations research, computers as a tool for problem solving and simulation, economic considerations of alternatives, control of product or service quality and quantity, specifications of the manufacturing process including equipment and tooling, planning, scheduling and control of work flow, and behavioral sciences in the organization and management of human endeavor.

Prospective students are encouraged to write directly to the School of Industrial Engineering and Management for career guidance information.

Graduate Programs

The School of Industrial Engineering and Management offers graduate programs leading to the Master of Industrial Engineering and Management degree, the Master of Science degree, and the Doctor of Philosophy degree. The School is also one of the joint sponsors of the Master of Manufacturing Systems Engineering degree.

The Master of Industrial Engineering and Management degree is a graduate professional degree with increased emphasis on professional practice, incorporating an engineering design experience during the final year of study. The Master of Science degree is characterized by a higher degree of technical specialization in a particular field of study. This degree program is designed to prepare men and women for technical positions such as research and consulting, as well as professional practice, in various kinds of organizations.

The Master of Science degree and the Master of Industrial Engineering and Management degree are intended to be especially attractive to all engineering graduates, including non-industrial engineers, and to many science majors. The two degree programs include a strong, technical component and an orientation to business and management which is complementary to other technical backgrounds.

The Doctor of Philosophy degree is designed to carry the student to the leading edge of knowledge in the profession of industrial engineering and management. It is intended to prepare men and women for highly specialized positions, such as research and consulting in industry, government and service organizations, and for teaching and research positions in colleges and universities.

The Master of Manufacturing Systems Engineering degree emphasizes a broad exposure to manufacturing from the perspective of the industrial, electrical and mechanical engineering disciplines. Students select courses from all three engineering disciplines. The program is oriented toward engineering practice in integrated manufacturing systems. Structured as a terminal degree, it prepares individuals with knowledge of all aspects of manufacturing systems, including management as well as hardware aspects of manufacturing.

The basic consideration in graduate education in industrial engineering and management at this institution is the most effective and efficient utilization of human, physical, and economic resources. Instruction in management embraces both qualitative and quantitative concepts, including analytical methodologies and social considerations pertinent to organizations of many kinds.

Staff and facilities are available for the study and practice of several phases of industrial engineering. Advanced degree programs may be arranged with major emphasis in fields of interest such as industrial management, management systems analysis and design, operations research, production control, quality assurance, economic analysis, methods engineering, energy management and other qualitative and quantitative facets. Students may complement industrial engineering and management courses with work in several other branches of engineering, as well as economics, business administration, computer science, statistics, mathematics, psychology, and sociology.

Admission Requirements. Graduation from an accredited engineering curriculum with scholastic performance distinctly above average qualifies the student for admission to the Master of Science or Doctor of Philosophy degree programs. Applicants not meeting these criteria should submit transcripts to the head of the School of Industrial Engineering and Management for evaluation.

Admission to the Master of Industrial Engineering and Management degree program is permitted for students who meet the minimum prerequisites as stated in “Master of Engineering.” A student may enter the program at a point for which he or she is qualified provided the minimum admissions criteria are met and the student is accepted by the School of Industrial Engineering and Management.

Degree Requirements. The Master of Industrial Engineering and Management degree requires the completion of approximately three years of study beyond the pre-engineering requirements, for a total of 157 semester credit hours, including the internship or professional practice.

The Master of Science degree in industrial engineering and management requires the completion of at least 30 semester credit hours beyond the bachelor’s degree, including a research thesis of six semester credit hours. A 32 semester credit hour option is also permitted and must include three to five hours of independent study.

The Doctor of Philosophy degree requires the completion of at least 90 semester credit hours of course work beyond the bachelor’s degree or 60 semester credit hours of course work beyond the master’s degree, including normally about 20 semester credit hours for a research thesis. In addition, the candidate must complete six semester credit hours of course work in an area such as mathematics, statistics, experimental techniques, or research methodology (as specified by the advisory committee).

The Master of Manufacturing Systems Engineering degree requires the completion of 33 semester credit hours beyond the bachelor’s degree and normally includes six credit hours based upon an internship in industry.
Mechanical and Aerospace Engineering

Professor and Head Lawrence L. Hoberock, Ph.D., P.E.

Mechanical engineering is a professional discipline which involves the invention, design, and manufacture of devices, machines and systems that serve the ever-changing needs of modern society. Mechanical engineering is an exceedingly diverse field which is not identified with or restricted to any particular vehicle, device or system. Mechanical engineers are vitally concerned with all forms of energy production, utilization and conservation. They deal with everything mechanical, whether it is small or large, simple or complex— from power lawn mowers to automobiles, fuel cells to nuclear power plants, gas turbine engines to interplanetary space vehicles, artificial limbs to life support systems, robotic manipulators to complex automatic packaging machines, precision instruments to construction machinery, household appliances to mass transit systems, and heating and air-conditioning systems to offshore drilling platforms. In virtually every organization where engineers are employed, mechanical engineers are included.

The aerospace option within mechanical engineering is concerned with the science and technology of flight, and the design of air, land and sea vehicles for transportation and exploration. This exciting field has already led man to the moon and continues to lead in the expansion of man's frontiers deeper into space and into the ocean's depths. Because of their unique backgrounds in aerodynamics and lightweight structures, aerospace-oriented mechanical engineers are becoming increasingly involved in solving some of society's most pressing and complex problems—such as high-speed ground transportation and pollution of the environment.

The aerospace option in mechanical engineering is separately accredited as an aerospace group program by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Program criteria developed by the American Institute of Aeronautics and Astronautics as well as by the Society of Mechanical Engineers have been applied in the accreditation process.

The broad background and problem-solving ability of mechanical engineers make them suited to engage in one or more of the following activities: research, development, design, production, operation, management, technical sales, patent law and private consulting. Versatility is their trademark. A bachelor's degree in mechanical engineering is also an excellent background for entering other professional schools such as medicine, dentistry, law or business (M.B.A.). A formal premedical option is available for students wishing to follow this avenue of approach to medical school. A petroleum engineering option is also available.

In the professional school, mechanical engineering students extend their study of the engineering sciences and consider applications of fundamental principles and analysis tools to the solution of real technological problems of society. Students make extensive use of modern electronic digital computers in virtually every course in their program. Design courses involve students in the solution of authentic, current and significant engineering problems provided by industrial firms, such as Ford, Fisher Controls, IBM, Whirlpool, Conoco, Phillips, Halliburton, Procter and Gamble, Mobil, Texas Instruments, Magnetic Peripherals, NASA, General Dynamics and Boeing. These industrial firms also are representative of those hundreds of firms that employ mechanical engineers with the aerospace option.

The student designs, with the guidance of an adviser, an individualized program of study consistent with his or her interests and career plans. Some students terminate their studies with a bachelor's degree, while others receive one of several graduate degrees.

Graduate Programs

The School of Mechanical and Aerospace Engineering offers programs leading to the Master of Mechanical Engineering degree, Master of Science degree, and the Doctor of Philosophy degree. The Master of Science degree and the Doctor of Philosophy degree prepare the graduate for research/development positions in industry and government, or for the teaching profession in engineering. These degrees are distinguished by the incorporation of a research component. The Master of Mechanical Engineering degree prepares the graduate for engineering practice and is distinguished by its incorporation of an off-campus internship in industry to give the student engineering design experience before graduation. Students may select course work and participate in research or design projects in the following areas: fluid mechanics and aerodynamics, thermal and environmental sciences, engineering acoustics and vibrations, mechanisms and systems design, energy conversion and utilization, solid mechanics and materials behavior, system dynamics and automatic control, fluid control systems, and biomechanics. Students are encouraged to take courses in mathematics and science and in other fields of engineering which fit into their programs.

Admission Requirements. Admission to the Graduate College is required of all students pursuing the M.Mech.E., M.S., or Ph.D. degree. Graduation from a mechanical or aerospace engineering curriculum accredited by the Accreditation Board for Engineering and Technology, with scholastic performance distinctly above average, qualifies the student for admission to the School of Mechanical and Aerospace Engineering as a candidate for the M.S. and Ph.D. degrees. Graduates from disciplines other than mechanical or aerospace engineering may be admitted if an evaluation of their transcripts by the School of Mechanical and Aerospace Engineering indicates they are prepared to take graduate-level course work in mechanical engineering, or can be expected to do so after a reasonable amount of prerequisite work.

Admission to the Master of Mechanical Engineering degree program is for students who meet the prerequisites stated under "Master of Engineering." A student may enter the program at any level for which the individual is qualified provided he or she meets the minimum admission criteria and is accepted by the School of Mechanical and Aerospace Engineering.

Degree Requirements. All degree programs follow an approved plan of study designed to satisfy the individual goals of the student, while conforming to the general requirements of the School of Mechanical and Aerospace Engineering and the Graduate College.

The Master of Mechanical Engineering degree requires 24 semester hours of approved graduate-level course work and a prescribed internship. As a result of the internship, a written report acceptable to the faculty must be submitted for completion of the degree requirement.

The Master of Science degree program with the thesis option requires 24 semester credit hours of approved graduate-level course work, and a suitable research thesis of six semester credit hours. The non-thesis option requires 32 semester credit hours of which two to five must be for an acceptable, individually directed creative activity which results in a written and oral report to the faculty.

The Doctor of Philosophy degree requires a minimum of 90 semester credit hours beyond the bachelor’s degree, including a dissertation for which no more than 30 semester credit hours may be awarded.

Division of Engineering Technology

Professor and Director James E. Bose, Ph.D., P.E.

Engineering technology education is concerned with the practical application of engineering achievement with emphasis upon the end product rather than the conceptual process. Whereas the development of new methods is the mark of the engineer, effective use of established methods is the mark of the technologist. Often the technologist will be expected to achieve what the engineer conceives.

Engineering technology education is a four-year program which leads to a Bachelor of Science in Engineering Technology. Graduates of the program are known as "technologists" and are trained either to assist engineers or to independently provide the support for engineering activities. The technologist receives an intensive education in his or her technical specialty and great depth in mathematics and technical sciences. The program provides breadth in related technical, communication and socio-humanistic studies. A "master of detail," he or she is capable of independent action in performance of technical activities and is frequently involved as a coordinator, expediter or supervisor of other technical personnel. His or her capability in technical sales and other public-contact positions is enhanced by his or her background in selected liberal studies.

The engineering technology graduate is qualified to select from a broad array of positions. In research and development, he or she may serve as a laboratory technician or engineering assistant in the performance of experiments, evaluation of data, or prototype development. In production, typical positions are engineering aide, process specialist, design technician, technical writer and production supervisor. In the field, he or she will often be identified as a technical representative, technical salesperson, field test technician or technical consultant.
The Bachelor of Science in Engineering Technology program is designed to prepare the student for responsible work in all phases of construction, and a broad knowledge of labor, materials, equipment, capital and construction procedures. The interdisciplinary approach of the construction management program offers the student specialized course work in an area of specialization. Normally, there are two groups of students who enroll in this program: those who have an associate degree in one of the traditional technology specialties, but desire more diversification than continuing in the same specialty; and those who have an associate degree from another institution in a technical specialty not offered at Oklahoma State University.

Each student who completes the program must have a great deal of technical knowledge to keep abreast with rapidly changing materials and methods of construction. Specialized courses in estimating, surveying, structures, construction planning and scheduling, construction law and insurance, field and office management and construction procedures provide the student with the background necessary for today’s construction industry. These specialized courses, in addition to a blend of the basic sciences, business, and general studies, produce a well-balanced curriculum for students in construction. Special attention is given to computer application in construction estimating.

Students with an interest in building structures may select courses in the “building” option of construction management which provides the student with a knowledge in highways, soils, foundations and other course work for a career in building construction.

Students with an interest in civil engineering structures may select courses in the “heavy” option of construction management which provides the student with a knowledge of highways, roads, structural engineering, soils, foundations and other course work for a career in the heavy and industrial construction industry.

Students with an interest in civil engineering structures may select courses in the “heavy” option of construction management which provides the student with a knowledge of highways, soils, foundations and other course work for a career in building construction. Graduates of construction management have shown the curriculum to be successful in their development as productive members of the construction industry, holding responsible positions as project managers, estimators, material and equipment salespersons, labor management and construction managers.

Electronics and Computer Technology

Associate Professor and Head Thomas G. Bertenshaw, M.S., M.Ed.

The electronics technology curriculum provides preparation for outstanding career opportunities not only in the electronics industry itself but also in many other areas in modern industry which depend upon electronics for control, communications or computation. Many opportunities exist for graduates to work in the areas of digital electronics, microcomputers and main-frame computers.

The work of the electronics graduate may range from assisting in the design and development of new equipment in the laboratory or applying modern microprocessors in the field, to the operation or supervision of production operations, technical writing, customer service and sales. The program provides the Bachelor of Science degree in Engineering Technology with an electronics major. To meet these diverse needs the program is laboratory-oriented and provides a strong foundation of mathematics and science, specialized course work in electronics technology and related technical areas, and courses in the area of communications and the social studies.

The electronics technology-computer option curriculum provides the preparation for graduates to enter the growing and exciting field of computer hardware and software. The demand for graduates having both computer hardware and software skills is quickly developing as the importance of automation, robotics, and artificial intelligence is recognized. Graduates of this program will be prepared for those opportunities in industry requiring considerable knowledge of both computer hardware and software.

The program provides the Bachelor of Science degrees in Engineering Technology with an electronics major-computer option. To meet the diverse needs that graduates will have, the program provides a strong foundation of mathematics, science, specialized courses in the computer field. Related courses in the humanities and social sciences are included to give the graduate a broader appreciation of the world in which the graduate will live and work.

Graduates will have the opportunity to work for many different kinds of industrial concerns. Computer manufacturers, as well as companies that are incorporating computers into their product will be interested in employing the graduates. Others may choose to seek employment in computer sales or software development.

Fire Protection and Safety Technology

Associate Professor and Head Harold R. Mace, M.S.

The nuclear/electronic/aerospace revolution, in conjunction with increased ecological awareness, has created an economic and moral responsibility to provide a cadre of trained personnel, knowledgeable in current loss-control and risk management techniques. In response to this challenge, the curriculum is designed to familiarize the student with inherent risks in such areas as fire protection, occupational safety and health, radiation hazards, product liability and industrial security. Courses and laboratories are structured to enable the recognition, evaluation and control of existing and potential hazards threatening losses to life, property or proprietary information.

The curriculum emphasizes industrial fire prevention, occupational health and safety, risk assessment and industrial hygiene.

General Technology

Professor and Head James E. Bose, Ph.D., P.E.

The general technology curriculum is designed to provide a bachelor’s degree program that will prepare men and women for employment as engineering technologists in more than one specific area. Normally, there are two groups of students who enroll in this program: those who have an associate degree in one of the traditional technology specialties, but desire more diversification than continuing in the same specialty; and those who have an associate degree from another institution in a technical specialty not offered at Oklahoma State University.

Each student who completes the program must show proficiency in the following areas by completing appropriate courses: technical graphics, machine tool processes, hydraulics, computer programming, electronics, controls, dynamics, supervision and instrumentation.

Manufacturing Technology

Associate Professor and Head Gerald R. McClain, M.S., CMfgT

The flow of affordable goods and products from producer to consumer is a major cornerstone of the free enterprise system that is enjoyed in the
Mechanical Power Technology
Professor and Head Marvin D. Smith, Ph.D., P.E.

The mechanical power program in Engineering Technology prepares the graduate for entry into a broad spectrum of the industrial world. It is concerned with the utilization of energy, development and transfer of power, and the measurement and control of fluid and mechanical devices.

This program is designed to introduce the student to the broad spectrum of mechanical devices and skills. It also produces a highly competent technical individual who is capable of immediate employment in diverse industrial, governmental and education institutions. It offers a depth of theoretical knowledge, as well as a breadth in equipment exposure.

A graduate of this program will be thoroughly familiar with the scientific principles and the equipment associated with the generation, transmission and utilization of mechanical power.

Petroleum Technology
Professor and Head Marvin D. Smith, Ph.D., P.E.

The petroleum program in Engineering Technology is primarily concerned with the application of equations and techniques toward effectively drilling for, producing, and processing petroleum fluids. Graduates become involved in predicting recoverable reserves, designing drilling programs, casing designs, selecting completion techniques, designing artificial life systems, and designing lease processing systems and pipelines. They also become involved in well testing, well evaluation, problem well analysis and well treatment.

This program is designed to provide the graduate with both the theoretical and practical knowledge required for employment and advancement in the diverse petroleum industry and related energy industries. Emphasis is placed on the application of equations rather than the derivation of them. Another important aspect is the practical operations and associated equipment required to accomplish the events listed above.

The graduates of this curriculum are prepared in communication skills, computer usage, problem solving techniques and organization. They are capable of independent technical activities and of assuming responsibility for projects.
College of Home Economics

Elaine Jorgenson, Ed.D., Interim Dean
Lynda Harriman, Ph.D., Associate Dean for Home Economics Cooperative Extension
Beulah Hirschlein, Ph.D., Director of Home Economics University Extension
Diane Jackman, Ph.D., Director of Student Academic Services and Alumni Programs

The College of Home Economics is composed of five departments and the School of Hotel and Restaurant Administration. The departments are Clothing, Textiles and Merchandising; Family Relations and Child Development; Food, Nutrition and Institute Administration; Home Economics Education and Community Services; and Housing, Interior Design and Consumer Studies. Each department prepares graduates to pursue professional careers in home economics in such areas as education, business, extension, research, communications, social welfare, public health, international service, and careers in various other agencies, organizations, and institutions.

The School of Hotel and Restaurant Administration graduates enter career fields in hotels/motels, diverse food service facilities, transportation, recreation, and resort complexes, health care centers, business-related careers, and education. Home economics is the field of knowledge and service focusing on families as they function in various forms. This focus also encompasses special family or household support services and institutions. Home economics integrates knowledge from its own research and other areas such as the physical, biological, and social sciences, and the arts, and applies this knowledge to the enrichment of the lives of individuals and families. The College of Home Economics is involved effectively and purposefully in the scientific, cultural, social, and economic dynamics of a changing society.

Accreditation

All study programs culminating in a B.S. degree at Oklahoma State University are accredited by the Council for Professional Development, American Home Economics Association. In addition, specialized agencies have approved or accredited specific programs in the College as follows:

The National Council for Accreditation of Teacher Education (NCATE) and the Oklahoma State Department of Education have accredited the nursery-grade 2 teacher certification program in family relations and child development at the bachelor's level.

The American Dietetic Association has approved the Plan IV dietetics program at the B.S. level.

High School Preparation

Good preparation in high school is important to success in college. Course work in the following areas will provide a good foundation for college courses: English, history, mathematics, science, computer science, economics, foreign language, geography, government, psychology, sociology, and speech.

Scholarships

A number of scholarships are awarded each year to students enrolled in the College of Home Economics. These scholarships are provided by alumni and friends of the College and vary in dollar value and selection criteria. Students make application for the scholarships in January, and the scholarships are given for the following school year-fall and spring semesters.

Off-campus Programs

In addition to courses offered on the Stillwater campus, the College of Home Economics offers course work at the University Center at Tulsa, at various locations in the state through the Educational Television System, and through University Extension programs offered throughout Oklahoma.

Academic Advising

Faculty members provide guidance and counseling as an integral part of the total program. The faculty-student guidance system helps maintain close interrelationships, thus providing an atmosphere conducive to goal accomplishment. All students with fewer than 28 credit hours are advised by the director of Student Academic Services. Upon successful completion of 28 credit hours the student is assigned to a faculty adviser in the major department.

Academic Programs

Undergraduate Program. The curricula for the B.S. in Home Economics are organized to include courses which contribute to a liberal education, common requirements in home economics, and professional requirements, which vary according to the area of specialization chosen by the student. The B.S. in Hotel and Restaurant Administration includes courses which contribute to a liberal education and professional requirements, which vary according to the option chosen by the student.

General Education requirements as specified by the University are met in each student's plan of study. Courses in the natural and social sciences, the humanities and the arts are included in the general education requirements. Courses in home economics are included for professional preparation and are consistent with the expectations of the professional and personal goals of the student.

A minor may be pursued in each of the departments within the College, in the School of Hotel and Restaurant Administration, and in general home economics. More details about specific requirements may be obtained from the respective departments.
Graduate Programs. Graduate study is available in all departments of the College of Home Economics.

The Master of Science degree is offered in the following fields: clothing, textiles and merchandising; family relations and child development; food, nutrition and institution administration; home economics education and community services; and housing, interior design and consumer studies.

The Doctor of Education degree is offered in the Department of Home Economics Education and Community Services. Students may have an area of emphasis in another field within the College of Home Economics.

The Doctor of Philosophy degree is an interdisciplinary degree program available through any of the departments in the College of Home Economics. Individualized programs lead to an area of specialization in any one of the departments and complementary strengths.

The Doctor of Philosophy degree in environmental science is an interdisciplinary degree program available through any of the departments in the College of Home Economics in cooperation with the environmental science program.

The Doctor of Philosophy degree in food science is an interdisciplinary program available through the Department of Food, Nutrition and Institution Administration as one of the participating departments.

Departmental Clubs and Honor Societies

Clothing, Textiles and Merchandising Club

Club Managers Association of America

College of Home Economics Alumni Association

Dean's Speakers Bureau

Family Relations and Child Development Club

Food, Nutrition and Institution Administration Club

Graduate Student Home Economics Association

Home Economics Education and Community Service Club

Home Economics Freshman Council

Home Economics Student Council

Hotel and Restaurant Society Club

Oklahoma Council on Consumer Interest Club

Omicron Nu (scholarship and leadership honor society)

Phi Upsilon Omicron (scholarship and leadership honor society)

Student American Society of Interior Design Club

Student Home Economics Association (SHEA)

Clothing, Textiles and Merchandising

Professor and Head Grovalynn Sisler, Ed.D.

The Department of Clothing, Textiles and Merchandising focuses on the interaction of people and the near environment through the utilization of clothing and textile products. Objectives of the Department are to assist students to:

1. better understand others through recognition of the importance of clothing and textiles as used by various cultural groups;
2. become aware of the economic structure in the United States and its relationship to consumer behavior in the area of clothing and textiles;
3. appreciate the value of preservation and study of historic costumes and textiles; and
4. become qualified for gainful employment in education and in areas of business and industry related to clothing and textiles.

Two undergraduate options are available: apparel design, and apparel merchandising. A minor is also available in the Department; information on requirements may be obtained from the department head.

Apparel design is for the student who is interested in a career in the apparel and textile design fields, in cooperative extension, in consumer services or in government. It focuses on developing creative ability, a knowledge of textiles and the consumer, and an understanding of the mass production of apparel. It provides an essential background for those who conduct, interpret, and use research involving fibers, fabrics or finishes for the consumer.

Apparel merchandising is for the student who is interested in buying, selling, promoting or coordinating fashion goods. Successful apparel merchandisers understand fashion, are productivity oriented and work well with people. Specialized course work and student work experience focus on developing competencies associated with major retail merchandising functions.

Students majoring in clothing, textiles and merchandising are employed by retail stores, advertising agencies, fabric, pattern or notion companies, apparel and textile manufacturers, and educational institutions.

Various combinations are available for students with interests in a specialized area. A clothing, textiles and merchandising major combined with specific home economics education requirements qualifies the student to teach in high school. Minors may be used in areas such as communications or marketing, or in another department in the College of Home Economics.

Graduate Programs

The Department of Clothing, Textiles and Merchandising offers work leading to the degrees of Master of Science and Doctor of Philosophy in home economics. Graduate study and research may focus on apparel and textile marketing, functional design of clothing, computer applications and curriculum development in clothing, textiles and merchandising.

The Master of Science Degree. The Master of Science degree is designed to prepare individuals for careers in secondary, post-secondary and college teaching; extension; consumer education; and merchandising or promotion in business and industry. It is a comprehensive yet flexible program designed to offer professional preparation for graduate study and research in fields related to human development, early childhood education, family relations and community services.

Students applying for the program must have a prerequisite of 30 semester credit hours in home economics or closely-related subject matter. A student with background deficiencies must remove such deficiencies before completing the master's degree.

The master's degree requires a minimum of 30 semester credit hours including six hours of thesis. The selection and organization of courses is made in consultation with the head of the Department and a departmental graduate committee. At least 21 semester credit hours must be completed in courses numbered 5000 or above. A minimum of 18 credit hours is required in the area of clothing, textiles and merchandising. Supporting courses may be taken in another area of home economics or in a related discipline.

The Doctor of Philosophy Degree. The Ph.D. prepares individuals for research positions in universities, business and industry, for university teaching and for administrative or management level positions. Admission to the program is based upon evidence that the applicant meets general requirements of the Graduate College, has demonstrated superior achievement, and can successfully complete a doctoral program. The student will be expected to have a master's degree or equivalent in clothing, textiles and merchandising or in a closely-related area from a college or university of recognized standing. A student may be required to demonstrate competence in clothing, textiles and merchandising in related areas, and further course work may be required before admission will be granted.

The plan of study is individually planned by the student in cooperation with an advisory committee. Each plan of study will be an integrated combination of courses and research providing for specialization within the area of clothing, textiles and merchandising and in related areas, and further course work may be required before admission will be granted.

Family Relations and Child Development

Professor and Head James Moran III, Ph.D.

Courses in family relations and child development assist students in developing attitudes and skills which are fundamental to satisfying relationships in the home and community and in preparing for people-oriented and service-oriented professions.

The Department has three major goals:

1. to offer professional preparation for graduate and undergraduate students in fields related to human development, early childhood education, family relations and gerontology;

2. to improve the opportunities for all university students to enjoy wholesome and satisfying personal and family lives through an improved understanding of concepts of human growth and relationships;

3. to contribute to available knowledge of child and family development through basic and applied research with the family viewed as the basic human relationship.

Six options are available, all of which stress integration of theory and research with practice.

1. Early Childhood Education-Certification. The certification option provides professional preparation for individuals to teach in public school programs for four-year-olds and kindergarten public school through second grade. The program provides a combination of theory, cur-
All six options may be strengthened and expanded with appropriate courses to prepare a student for graduate study. The B.S. degree requires a minimum of 124 semester credit hours. A minor is also available in the Department; information on requirements may be obtained from the department head. The National Council for Accreditation of Teacher Education (NCATE) and the Oklahoma State Department of Education have accredited the B.S. program leading to nursery-second grade teacher certification.

Students completing degrees in this area, according to programs of study, follow careers in teaching children under six, public school teaching and social work in state and county human and community service agencies. Graduate study prepares the individual for teaching in colleges and universities, extension service, research, and supervisory positions and specialist positions in human and community service agencies.

Graduate Programs

The Department of Family Relations and Child Development offers work leading to the Master of Science degree and the Doctor of Philosophy in home economics-family relations and child development. In addition, students may obtain the Doctor of Education degree through the Department of Home Economics Education and Community Services with specialization in family relations and child development.

The Master of Science Degree. The Master of Science degree in family relations and child development provides professional education for individuals who wish to prepare for people-oriented careers in programs such as public school kindergartens, early childhood development centers, child guidance centers, family and community programs, and extension programs. Masters degree plans in FRCD are flexible and individually designed with a research and theory base to develop academic competence specific to the personal career goals of each student. Students are encouraged to take some courses outside of the department and college. Five plans are available.

1. Family Relations. The family relations plan provides students with research and theoretical foundations in addition to the practical skills necessary to work in a variety of family-oriented careers. Specifically, the program offers professional training for job placement in social and community agencies; a broad-based exposure to the relationships between families and work, school, community and other human environments; and, a background in current research and theory.

2. Gerontology. The gerontology plan is an interdisciplinary specialty that combines family relations and human development within FRCD with course work available from several other departments at Oklahoma State University. The objectives of this specialty are to train students in research, education and program development with older adults. Theoretical and research efforts focus on the aging process related with exposure to the delivery of services provides a balanced degree plan for both practitioners and researchers.

3. Child Development. The child development plan develops competencies related to understanding children and their behavior in a variety of environments. Career settings include colleges and universities, child guidance centers, extension programs and hospitals.

The program balances academic knowledge from current research and theory in child development with experiences in working with children in laboratory and classroom environments. Students may pursue doctoral studies in child development.

4. Marriage and Family Therapy. The marriage and family therapy plan is jointly administered by the departments of Family Relations and Child Development and Applied Behavioral Studies. This option provides students with basic knowledge, skills and a professional identity essential for entry level practice of marital and family therapy. This plan has restrictive content and a curriculum designed to meet the rigorous national guidelines set by the American Association for Marriage and Family Therapy (AAMFT). The curriculum includes course work in individual development, marital and family systems, marital and family therapy, professionalism and ethics, research and statistics and supervised practicum. Graduates practice in controlled settings and under supervision with methods for determining how couple and family problems develop and can be resolved.

5. Early Childhood Education. The early childhood education plan provides professional career development for teachers and administrators of public and private schools and day care centers. The early childhood education plan offers specialization in early childhood education program supervision and administration; course work that may lead to partial fulfillment of requirements for state certification; and, a balance of theoretical base and research experience. Students selecting early childhood education as their area of emphasis may work toward licensure certificates. The early childhood education plan is not designed to meet the rigorous national guidelines set by the American Association for Marriage and Family Therapy. This plan is not considered for admission.

Admission Requirements. Admission to the graduate program is selective and based on a variety of criteria including grade-point average, Graduate Record Examination (GRE) scores, letters of recommendations, and student goals. Students need not have majored in family relations and child development as undergraduates but must have a minimum of 12 upper-division semester credit hours in home economics, human development, family studies, or early childhood education. Students not meeting these criteria will be required to complete prerequisite undergraduate courses in order to be considered for admission.

Degree Requirements. A minimum of 30 credit hours is required for the master's degree. A minimum of 18 credit hours from the areas of family studies, child development, and early childhood education is required. A minimum of 21 credit hours in courses numbered 5000 or above is also required. Supporting courses may be taken in any of the departments of the College of Home Economics or in psychology, sociology, education, or other related areas with permission of the graduate faculty. Specific guidelines for developing the plan of study for thesis and non-thesis options (30-hour minimum) are available from the Department.
The Doctor of Philosophy Degree. The Doctor of Philosophy degree is awarded in home economics with specialization in family relations and child development. The program offers an interdisciplinary combination of courses and research experiences. Courses from other departments in the College of Home Economics and other colleges at Oklahoma State University are selected to provide a flexible yet rigorous program.

The interdisciplinary Ph.D. program trains competent researchers and educators who will make contributions to the scientific literature in child and family sciences. Students establish competencies in: (1) an area of specialization within family relations or gerontology or child development; (2) research design and implementation including computer analysis and theory development; (3) interdisciplinary work to synthesize knowledge from a variety of academic specialties; and (4) personal leadership within a specific area of specialization.

Admission Requirements. Admission to the program is selective and is based on evidence that the applicant meets the general requirements of the Graduate College, has demonstrated superior achievement, and can successfully complete a doctoral program. The student will be expected to have a master's degree or equivalent in family relations or child development or in a closely related area. The degree must be from a college or university of recognized standing. A student may be required to demonstrate competency in major or related subject matter areas. Examinations or further course work may be required for admission to the program. Recommendations regarding admission will be made by an interdepartmental doctoral admission committee. Admission is based on a variety of criteria including grade-point average, Graduate Record Examination (GRE) scores, letters of recommendations, student goals, samples of writing, and critiques of research.

Degree Requirements. All degree programs follow an approved plan of study which must be submitted at the designated time. The plan of study is individually planned by the student in cooperation with an advisory committee. Each plan of study will be an integrated combination of courses and research providing for a specialization within the area of family/child studies and synthesis of knowledge from related areas within and outside home economics.

Emphasis is on the attainment of competencies; however, a minimum of 60 semester credit hours beyond the master's degree will be required, including not more than 20 semester credit hours for a research thesis. In addition, course work will be required that will facilitate the student's research effort, provide an area of specialization in family/chid studies, and focus on competencies dealing with reciprocal relations between families and one or more aspects of their natural and human-built environments.

The Doctor of Education Degree. The Doctor of Education degree is primarily for those who wish to pursue careers related to education and the program focuses on the preparation of administrators and teachers.

For admission and degree requirements refer to the appropriate section in "Home Economics Education and Community Services" in the Catalog. The area of specialization in this degree may be in family relations and child development and the dissertation research may be under the direction of an adviser in the Department of Family Relations and Child Development.

Food, Nutrition and Institution Administration

Professor and Interim Head Lea Ebro, Ph.D.

Nutrition and dietetics are dynamic and diverse professions which integrate physical and biological sciences, behavioral and social sciences, nutrition, food science, food service management, communication skills, data processing and evaluation. Depending on the student's area of interest and career goals, courses in human resources, management, marketing, finance, industrial engineering or journalism may be advised.

Nutrition professionals work in a wide range of settings, in both the public and private sector and assume an array of challenging responsibilities.

Two options are offered: dietetics and human nutrition. The dietetics option meets the Plan IV academic requirements and is approved by the American Dietetic Association. With appropriate electives, minors may be obtained in hotel and restaurant administration or business administration. The human nutrition option is ideal for students desiring greater depth in the physiological and biochemical sciences in preparation for medical school, graduate study and research in human nutrition. The B.S. degree requires a minimum of 128 semester credit hours.

Career opportunities for a graduate with a bachelor's degree include: health care dietitian and administrator, nutrition or food science researcher, fitness/wellness consultant, food service design consultant, dietary products or equipment representative, public health nutritionist, entrepreneur in dietetic programs and services, and corporate dietitian/nutritionist.

Some of the specialized careers and college teaching require additional course work or advanced degrees. When students successfully complete the academic and experience components (dietetic internship or preprofessional practice program (AP4), they are eligible to write the Registration Examination for Dietitians which is administered in April and October each year. The individual who is successful on the exam is a registered dietitian and entitled to use the initials "RD." to signify professional competence.

ADA approval for the Preprofessional Practice Program (AP4) is pending. The AP4 program includes graduate enrollment and preprofessional practice in Oklahoma City or Tulsa medical centers and government agencies.

Graduate Programs

Programs of study leading to the Master of Science and the Doctor of Philosophy degrees are offered. Graduates are prepared for teaching, research or management positions in nutrition, food service administration and dietetics. Such positions are available in universities, hospitals, federal and state agency programs, school food services, management contract firms, and in institutional food services such as in university residence halls and in-plant feeding. All candidates are encouraged to enhance their major with other professional home economics subjects, general professional education and related fields.

The Master of Science Degree. To be admitted to the master's degree program, students are expected to have undergraduate preparation comparable to the undergraduate major in the department. This means a minimum of 30 semester credit hours in departmental and home economics courses closely related to the major. Evidence of academic ability (approximately a 3.00 grade-point average in undergraduate work) and English proficiency is required. The Graduate Record Examination is recommended but not required. The master's degree requires a minimum of 30 semester credit hours with six semester credit hours for research and thesis. Each student prepares a thesis which is defended in a final oral examination.

Food, Nutrition and Institution Administration

Professor and Interim Head Lea Ebro, Ph.D.

Nutrition and dietetics are dynamic and diverse professions which integrate physical and biological sciences, behavioral and social sciences, nutrition, food science, food service management, communication skills, data processing and evaluation. Depending on the student's area of interest and career goals, courses in human resources, management, marketing, finance, industrial engineering or journalism may be advised.

Two options are offered: dietetics and human nutrition. The dietetics option meets the Plan IV academic requirements and is approved by the American Dietetic Association. With appropriate electives, minors may be obtained in hotel and restaurant administration or business administration. The human nutrition option is ideal for students desiring greater depth in the physiological and biochemical sciences in preparation for medical school, graduate study and research in human nutrition. The B.S. degree requires a minimum of 128 semester credit hours.

Career opportunities for a graduate with a bachelor's degree include: health care dietitian and administrator, nutrition or food science researcher, fitness/wellness consultant, food service design consultant, dietary products or equipment representative, public health nutritionist, entrepreneur in dietetic programs and services, and corporate dietitian/nutritionist.

Some of the specialized careers and college teaching require additional course work or advanced degrees. When students successfully complete the academic and experience components (dietetic internship or preprofessional practice program (AP4), they are eligible to write the Registration Examination for Dietitians which is administered in April and October each year. The individual who is successful on the exam is a registered dietitian and entitled to use the initials "RD." to signify professional competence.

ADA approval for the Preprofessional Practice Program (AP4) is pending. The AP4 program includes graduate enrollment and preprofessional practice in Oklahoma City or Tulsa medical centers and government agencies.

Graduate Programs

Programs of study leading to the Master of Science and the Doctor of Philosophy degrees are offered. Graduates are prepared for teaching, research or management positions in nutrition, food service administration and dietetics. Such positions are available in universities, hospitals, federal and state agency programs, school food services, management contract firms, and in institutional food services such as in university residence halls and in-plant feeding. All candidates are encouraged to enhance their major with other professional home economics subjects, general professional education and related fields.

The Master of Science Degree. To be admitted to the master's degree program, students are expected to have undergraduate preparation comparable to the undergraduate major in the department. This means a minimum of 30 semester credit hours in departmental and home economics courses closely related to the major. Evidence of academic ability (approximately a 3.00 grade-point average in undergraduate work) and English proficiency is required. The Graduate Record Examination is recommended but not required. The master's degree requires a minimum of 30 semester credit hours with six semester credit hours for research and thesis. Each student prepares a thesis which is defended in a final oral examination.
The plan of study is individually planned with an adviser who is designated after entry into the program. An advisory committee gives final approval of the plan.

The Doctor of Philosophy Degree. The Ph.D. degree is an interdisciplinary degree program. To be admitted, applicants will be expected to provide evidence of academic ability and preparation, and will be reviewed by an interdepartmental doctoral admission committee. An emphasis in human nutrition or in food systems administration and management or in food science is available, depending on the student's interests and qualifications. To acquire the competencies required, the candidate will need to study in the areas of research, nutrition, food service management, education and selected areas within the College of Home Economics and in other departments outside the College. (See also "Home Economics-Doctor of Philosophy").

Home Economics

Professor and Interim Dean of Home Economics, Elaine Jorgenson, Ed.D.

Graduate Programs

The Doctor of Philosophy Degree. The Ph.D. is an interdisciplinary degree program in the College of Home Economics with students located in any of the following departments: Clothing, Textiles and Merchandising; Family Relations and Child Development; Food, Nutrition and Institution Administration; Home Economics Education and Community Services; and Housing, Interior Design and Consumer Studies. (For additional information, see departmental descriptions.) Graduates are prepared for leadership positions involving research, education, or administration in universities, government agencies, hospitals, military service, business, industry, and other people-oriented programs at the international, national, regional, and state levels.

Admission to the program is based upon evidence that the applicant meets general requirements of the Graduate College and has demonstrated superior scholarly achievement and professional success. The student is expected to have a master's degree or equivalent in the chosen or a closely related area from a college or university of recognized standing. A student may be required to demonstrate competence in the chosen and related areas, and further course work may be required before admission will be granted.

Recommendations to the dean of the Graduate College regarding admission will be made by an interdepartmental doctoral admission committee.

Plan of Study. The plan of study is individually planned by the student in cooperation with an advisory committee. Each plan of study will be an integrated combination of courses and research providing for specialization within a chosen area including synthesis of knowledge drawn from departments within and outside of home economics.

Emphasis is on attainment of competencies rather than on the completion of specific numbers of credit hours of course work and research. However, a minimum of 60 semester credit hours beyond the master's degree will be required. Judgment of the plan that will lead to the expected competencies and of the extent to which these have been developed will be the responsibility of the student's advisory committee.

Each student will develop competence in an area of specialization, in research, in dealing effectively with the reciprocal relations between families and one or more aspects of their environments, and in exerting leadership in one or more professional roles.

Home Economics Education and Community Services

Associate Professor and Interim Head Margaret Callisen, Ph.D.

Four options are available in the Department:
(1) vocational certification and extension, (2) general certification and extension, (3) occupational certification, (4) communications, community services and extension.

The undergraduate curriculum prepares men and women for professional positions in (1) community services, (2) secondary and adult education, (3) home economics communications (journalism, radio and television), (4) extension and (5) business. Programs meet the approval of the State Board of Education, state and federal offices of vocational and technical education and the Cooperative Extension Service of the University.

Study for the bachelor's degree programs includes courses in three major areas: general education, professional education and specialization in areas of home economics. All students entering the Department should request an information sheet identifying required grade-point averages and other specific regulations for graduation. The Bachelor of Science in Home Economics, Master of Science, Doctor of Education, and Doctor of Philosophy degrees are offered in the Department. The Ph.D. degree provides for specialization in home economics education and community services.

A minor in the Department is available for students who would like some background in teaching adults or youth in informal settings. Information concerning requirements for a minor may be obtained from the department head.

Many job opportunities in business, industry, education and government are available for students majoring in home economics education and community services. Students may also develop double majors with many departments. For example, students may develop double majors in home economics education and community services with journalism and broadcasting. A minor in any of these areas or a combination of more than one area may be taken with a major in any department within the College of Home Economics. (See "College of Arts and Sciences" section of the Catalog for information about the School of Journalism and Broadcasting.)

The media positions often filled by home economics communication specialists include writing and editing newsworthy stories and self-help information for the mass media dealing with food, nutrition, fashion, child care, family relations, education, consumer resources, housing, interior design and life styles; production of and participation in radio and television broadcasts; preparation of commercial messages for print and audio-visual media; market analysis and media selection; magazine and book editing; speech writing; and preparation of brochures and other promotional literature, product information and stockholder reports.

Students interested in any area of communications should confer early with appropriate faculty advisers in both the College of Home Economics and the School of Journalism and Broadcasting.

Graduate Programs

The Department of Home Economics Education and Community Services offers study for the Master of Science, the Doctor of Education, and the Doctor of Philosophy degrees. This advanced professional education is for those men and women preparing for positions in teacher education, state supervision, cooperative extension, community services, educational consulting, college teaching, and leadership and administrative roles in home economics.

The Master of Science Degree. To be eligible for admission to the Master of Science degree program, applicants must have earned a bachelor's degree with a minimum of 30 semester credit hours in home economics, related areas, or have had work experience in community services.

The Master of Science degree program may be planned with an emphasis in community services, cooperative extension, or teacher education. The master's degree requires a minimum of 30 semester credit hours with a thesis or a minimum of 32 semester credit hours with a creative component.

The Doctor of Education Degree. Students desiring admission to the Doctor of Education degree program will compile a folder for review by the departmental faculty. The plan of study for the Doctor of Education degree is planned by the student in consultation with the major adviser and approved by the student's doctoral committee. Academic background, experience, needs, and professional goals are considered when planning a program of study.

The Doctor of Philosophy Degree. Students desiring admission to the Doctor of Philosophy degree program with a specialization in home economics...
nomics education and community services will compile a folder for review by an interdepartmental doctoral admissions committee.

Study in this area may involve home economics in higher or secondary education; formal and nonformal education; vocational, adult and continuing education; and educational processes in home economics such as evaluation, curriculum planning and instruction. To acquire the competencies identified for graduates of this program the candidate will need to study in the areas of research, home economics education and community services, and selected areas within home economics and in departments outside of home economics (see "Home Economics-Doctor of Philosophy" for an additional description).

More detailed information on graduate study in the Department of Home Economics Education and Community Services can be obtained by writing the head of the Department.

**School of Hotel and Restaurant Administration**

Professor and Director G. Baker Bokorney, Ed.D.

The hotel, restaurant and club industry provides a wide range of professional management career possibilities for students genuinely interested in service-oriented industries. Opportunities within the industry for entrepreneurship, professional advancement and growth are unlimited.

Business and industry in hotels, motels, clubs, and restaurants are complex. Their management requires knowledge and skill in many areas for the proper use of a great number of products in a wide variety of processes. The guest or customer must be received in a courteous manner, housed in a well-kept, tastefully decorated space with modern appointments, served appetizing food, properly prepared, skillfully purchased, carefully stored and controlled. Professional management in the hospitality industry encompasses knowledge of a myriad of related and interrelated processes.

Career opportunities include a wide range of specializations in sales, personnel administration, labor relations, public relations and promotion, auditing, front office and general management positions. Positions as regional managers or directors for hotel, motel, restaurant, industrial, and fast food management chains are additional possibilities. Airline catering, food processing, convenience food processing, vending and individual restaurant entrepreneurship are excellent career areas.

To meet the needs of the industry and to provide sound academic training at the undergraduate level, the curriculum emphasizes important areas of learning including professional and general education. The professional area includes courses in accounting, law, finance, communications, insurance, marketing and personnel management. Courses in food preparation, food and beverage purchasing and control, layout and design, interior design, sales and promotion, front office management, tourism, and advanced hotel and restaurant management are also included in the specialized area. General requirements are met through courses in English and the natural and social sciences, humanities, political science, history and government, psychology, economics, speech, chemistry, mathematics and computer application. The B.S. degree in Hotel and Restaurant Administration may be earned by completing a minimum of 124 semester hours and maintaining a 2.30 grade-point average in the major area.

A minor in business administration is built into the curriculum. Information on requirements is available from the school director.

Special facilities for learning experiences include the Union Club and the catering and engineering areas of the Student Union, dining and food facility areas in the residence halls, and local businesses.

Additional courses necessary to meet Plan IV academic requirements of the American Dietetic Association may be elected and remain within the 124 total hours required.

A well-balanced academic high school program is recommended for students interested in hotel or restaurant management as a career. Mathematics, accounting, typing, English, speech and hospitality-related courses are excellent background courses.

**Housing, Interior Design and Consumer Studies**

Professor and Interim Head Margaret J. Weber, Ph.D.

The undergraduate curriculum in housing, interior design and consumer studies enables the student to major in one of the three areas included in the Department. The degree requires 124 credit hours and leads to the Bachelor of Science degree with an option in housing or consumer studies. The interior design option requires 130 credit hours. A minor is available in the Department in housing and in consumer studies. Information on requirements is available from the department head.

The housing option incorporates an interdisciplinary approach to the study of housing in relation to other disciplines such as economics, political science, sociology, psychology, technology and design. At the micro level, housing provides the basic needs of individuals and families for shelter. At the macro level, it includes theoretical elements from a variety of disciplines that affect housing decisions. Possible career opportunities for graduates include placement in government, housing and urban development offices, community planning, financial institutions, building industry operations or housing-related associations.

The interior design option encompasses interior spaces within the human environment. Competency includes fundamental design, design analysis, space planning and programming, selection of furnishings including design of all interior spaces, and an understanding of related aspects of environmental design. Technical development includes knowledge of structure with emphasis on interior construction; knowledge of building systems, equipment and components; and ability in communication skills. Career opportunities are found in interior design professional practice, work with architectural firms, historical restoration and preservation, facility management and development, and merchandising. The Foundation for Interior Design Education Research (FIDER) has accredited the undergraduate interior design program.

The consumer studies option combines family economics and consumer economics into a single focus on the household as an economic unit. The curriculum includes the study of households as they function in the product, labor and financial markets. Households as consumers of goods and services are the focus of marketing strategies of business. Therefore consumer behavior and marketing strategies are studied from the consumer perspective. As individuals and families interact in the labor market, decisions are made regarding time allocations among labor for a wage, time in household production and leisure time. Human capital accumulation and time use in these alternatives are studied. Interaction in financial markets for stocks, bonds and other investments is studied in personal finance as are budget allocations, risk management, retirement income, and estate planning. The role of government is studied as it interacts in these markets to provide consumer protection, promote employment, generate revenue through taxation, and improve the economic well-being of individuals and families through social programs. The focus of consumer studies is on the economic aspects of household decision-making.
Graduate Programs

The Department of Housing, Interior Design and Consumer Studies offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees. Study and research may be concentrated in the areas of housing, interior design or consumer studies. Specialization at the master's and doctoral levels focuses on internship or research experience directed toward the student's career objectives. Both the Master of Science and Doctor of Philosophy degrees are tailored around professional goals of the candidate, departmental expertise, and College of Home Economics and Graduate College requirements.

The Master of Science Degree. The student may earn the Master of Science degree by majoring in housing, interior design, and/or consumer studies and completing a minimum of 30 semester credit hours including a course in research methods and six credit hours for a thesis, or a minimum of 32 semester credit hours including a course in research methods and a creative component. The student's record and experiences serve as criteria for the selection and organization of courses. Selections are made by the student in consultation with the head of the Department and members of the departmental graduate faculty. A minimum of 16 semester credit hours in the area of housing, interior design, and consumer studies are required. A minimum of 21 semester credit hours should be in courses numbered 5000 or higher. Minor or supporting courses may be selected from other areas of home economics, or from related subject matter areas such as architecture, communications, economics, marketing, finance, psychology, sociology or public policy, with permission of the graduate committee.

The Doctor of Philosophy Degree. Candidates seeking admission to the Doctor of Philosophy degree program in home economics choose a specialization in housing, interior design or consumer studies or a combination of the above options and must meet requirements of the Graduate College. A professional file is submitted for review by an interdepartmental admissions committee. The advanced work is complementary to the student's personal and professional goals in the selected concentration area. Plans of study include courses from departments within and outside the College of Home Economics with a strong emphasis on research. Programs are designed around competencies for professional success consistent with the candidates' objectives, rather than a specific number of graduate credit hours. However, a minimum of 90 semester credit hours beyond the bachelor's degree will be required. (See "Home Economics-Doctor of Philosophy" for more information.)

Graduates will be prepared for a variety of professional opportunities in education, government and business including research and program development.

More detailed information on graduate study in the Department of Housing, Interior Design and Consumer Studies may be obtained by writing the head of the Department.
College of Osteopathic Medicine

Clyde B. Jensen, Ph.D., President
Jan G. Womack, Ph.D., Vice President of Administrative Services
Jack R. Wolfe, D.O., Dean of Academic Affairs
Robert C. Ritter, Ph.D., Associate Dean of Preclinical Education
Larry D. Cherry, D.O., Assistant Dean of Clinical Education
Thomas R. Pickard, D.O., Interim Assistant Dean of Postdoctoral Education
Richard A. Wansley, Ph.D., Assistant Dean of Research, Sponsored Programs, and Service
Daniel E. Overack, Ph.D., Assistant Dean of Students

The College of Osteopathic Medicine was founded in 1972 in response to a physician shortage in the state. The College opened its doors in 1974 and graduated its first class in 1977. In 1988, the College was merged with Oklahoma State University and continues to prepare students to be primary care physicians with emphasis in rural medicine. The College’s campus, a modern, three-building complex, is located on a sixteen-acre site on the west bank of the Arkansas River, just minutes from downtown Tulsa.

Although still addressing the needs of Oklahoma, the College has broadened its service area to include Arkansas, Louisiana, New Mexico, Colorado, Kansas, and southwest Missouri. In 1981, the College opened a clinical teaching facility a half-mile south of the main campus. The College Clinic, which sees approximately 1,800 patients a month, is both a teaching clinic for medical students and a health care resource for residents of the west Tulsa area. The Clinic provides comprehensive health care and is staffed by licensed osteopathic physicians who supervise students in the care of patients.

Osteopathic Medicine

Promoting a holistic approach to health care, osteopathic physicians treat the entire patient, not just symptoms, and traditionally have excelled in general and family health care. The doctor of osteopathy is a fully-trained physician who prescribes drugs, performs surgery, and selectively utilizes all accepted scientific modalities to maintain and restore health. They are licensed to practice all phases of medicine (including surgery), and offer their patients an expanded dimension of health care through osteopathic manipulation, a hands-on technique that uses palpation and manipulative procedures of the musculoskeletal system to diagnose illness and treat patients. Osteopathic medicine embraces the philosophy that the human body is a balance of individual components that interact through the musculoskeletal system.

Minimum Admission Requirements

At time of application, the applicant must have an overall grade-point average of at least 3.00 (on a 4.00 scale) and a preprofessional science GPA of at least 2.75.

At the time of entry, the applicant must have completed:
1. At least three years (90 hours) and not less than 75 percent of the courses required for the baccalaureate degree at a regionally-accredited college or university;
2. A full academic year sequence (generally eight to ten hours) with no grade below a “C” (2.00 on a 4.00 scale) in each of the following subjects: English, biology, general chemistry, organic chemistry, and physics;
3. The following courses are strongly recommended: biochemistry, comparative anatomy, embryology, microbiology.

Applicants must take the Medical College Admissions Test (MCAT). They are encouraged to take the examination in the spring prior to applying; however, fall scores are acceptable. Applicants taking the MCAT in the spring after application are at a distinct disadvantage because no offer of admission can be made until the College receives test results.

All applicants from Oklahoma and the regional service area (Arkansas, Louisiana, New Mexico, Colorado, Kansas, and southwest Missouri) who have fulfilled these requirements will be invited to an on-campus interview. Select applicants from outside the region will be invited to an interview as well. Applicants must participate in the interview to qualify for further consideration. Interview results and other data submitted will be considered when determining which applicants have demonstrated appropriate levels of scholarship, aptitude, and motivation for admission to the program. Class size is limited to 88 students.

The annual application deadline is March 1.

College Curriculum

Divided into Preclinical and Clinical Education, the curriculum at the College emphasizes general practice. The four-year program uses a coordinated, spiraling systems approach in which subject matter is continuously re-introduced in greater depth and complexity.

The first year of study concentrates on the basic sciences and preliminary clinical concepts. Preparation of the student for early patient contact requires selective background in anatomy, physiology, behavioral science, techniques of physical examination, diagnosis and patient interview, and recognition of normal and abnormal patterns of physical conditions and disease. The next three semesters emphasize the interdisciplinary study of the structure and function of body systems. In addition, students are introduced to specialized clinical care and medical procedures related to each body system.

The final sixteen months of the program are devoted exclusively to clinical rotations, where students work with patients under physician-faculty supervision. The student rotates through basic hospital services, including general medicine, surgery, obstetrics/gynecology, pediatrics, internal medicine, and emergency room, and spends a few weeks at a small rural hospital, major urban hospital, primary care clinic, psychiatric facility, community health facility, office of a private physician, and one elective location.

Students graduate from the four-year program with the Doctor of Osteopathy (D.O.) degree. Following graduation, students are required by state licensing boards to complete at least a one-year rotating internship approved by the American Osteopathic Association. Those who wish to specialize enter a residency program following the internship. Graduates are eligible to be licensed to practice as soon as they complete the internship.

Detailed information on the College of Osteopathic Medicine can be found in the College’s academic catalog, available from the College.

College of Osteopathic Medicine of Oklahoma State University
1111 West 17th Street
Tulsa, Oklahoma 74107
(918) 562-1972

Affiliated Institutions

Students gain clinical training beginning in their second year at COM-OSU, working under physician supervision in small community hospitals, with private practitioners, in major hospitals, at the College Clinic, and in Indian Health Service hospitals. To demonstrate the diversity of clinical experience
students receive, listed below are some of the College's affiliated institutions:
- Tulsa Regional Medical Center, 533 beds
- Dallas Forth Worth Medical Center, 377 beds
- Charles Still Hospital (Jefferson City, MO), 184 beds
- Riverside Hospital (Wichita, KS), 87 beds
- Claremore Health Center, 74 beds
- Guymon Memorial Hospital, 53 beds
- Tahlequah City Hospital, 51 beds
- Hominy City Hospital, 26 beds

Physician Placement
The College maintains close contact with its graduates and can offer assistance in setting up a practice following the graduate's internship and residency training. The physician placement officer helps to assess the physician need in a community, estimates costs of establishing and operating a practice, and matches physicians to communities where both the community and the physician will benefit.

Selection Factors
The College considers applications for admission from all qualified candidates without regard to age, sex, creed, race, or national origin. Strong preference is given to Oklahoma residents and residents from the regional service area of Arkansas, Louisiana, New Mexico, Colorado, Kansas and southwest Missouri. Those who have experienced unequal educational opportunities for social, cultural or racial reasons are particularly urged to apply. Applicants must be U.S. citizens or have obtained permanent resident status to be considered.

Accreditation
The College is accredited by the Oklahoma State Regents for Higher Education and the Bureau of Professional Education of the American Osteopathic Association, the recognized accrediting agency for institutions that educate osteopathic physicians.

Financial Aid
The college employs a full-time financial aid officer who works to ensure that students are not prevented from attending the College because of finances. The primary purpose of the College's aid program is to provide financial assistance to students who would otherwise be unable to afford tuition.

Although the principal responsibility for financing an education remains with the student and his or her family, the College will work to offer campus-based aid to supplement that contribution.

Because the number of applicants and their total requests each year exceed the resources available, a selection process is necessary to see that the most deserving and best qualified students have first claim on available resources. Financial aid options include loans, scholarships, and grants, as well as work/study programs and return service agreements.

A Family Financial Statement and other required applications are available at the College.

Honor and Service Organizations
American College of General Practitioners - Undergraduate Chapter
Atlas Fraternity (social)
Christian Medical Society
Delta Omega (national osteopathic sorority)
Geriatric Medicine Club
Inter-Club Council
Minority Student Organization
Osteopathic Sports Medicine Society
Sigma Sigma Phi (honor society)
Society for the Advancement of Osteopathic Medicine
Student Associate Auxiliary
Student Osteopathic Medical Association
Undergraduate American Academy of Osteopathy
College of Veterinary Medicine

Joseph W. Alexander, D.V.M., M.S., Dean
J. Mack Oyler, D.V.M., Ph.D., Associate Dean of Student Affairs
Lloyd C. Faulkner, D.V.M., Ph.D., Associate Dean of Research and Graduate Studies
Londe G. Stratton, D.V.M., Ph.D., Assistant Dean of College Outreach
James E. Breazile, D.V.M., Ph.D., Director of Laboratory Animal Resources
Dan E. Goodwin, D.V.M., Ph.D., Director of Animal Disease Diagnostic Laboratory

The primary objective of the College of Veterinary Medicine is to educate veterinarians for private practice. However, the professional curriculum provides an excellent basic medical education in addition to training in diagnosis, disease prevention, medical treatment, and surgery. Graduates are qualified to pursue careers in many facets of veterinary medicine and health-related professions.

Accreditation
The College has full academic accreditation status approved by the Council on Education of the American Veterinary Medical Association. Accreditation is based on an assessment of ten essential factors, namely, the college's organization, its finances, physical facilities and equipment, clinical resources, library and learning resources, enrollment, admissions, faculty, curriculum, and continuing and post-graduate education.

Preparatory Requirements
Attainment of the degree of Doctor of Veterinary Medicine requires, at a minimum, six academic years of collegiate training. In preparation for the professional training the student must complete both prescribed and elective collegiate courses. The minimum prescribed preparatory studies, totaling 60 semester hours of course work, can be completed in two calendar years. Most of the entering veterinary medical students in recent years have had three years of preparatory training or a bachelor’s degree. It is recommended that the student undertake an appropriate regular bachelor’s degree program in the sciences, in the course of which he or she will complete the prerequisites for entry into the College of Veterinary Medicine by the end of at least the third year of preparatory training.

Admission Requirements
Collegiate course requirements for entry into veterinary medical college may be completed at any accredited university or college. Special pre-veterinary curricula are available at Oklahoma State University through the College of Agriculture and the College of Arts and Sciences. Both colleges offer programs of study in pre-veterinary medical sciences which provide for the award of a bachelor's degree after the first or second year of veterinary medical studies to those persons who gain early entry into a veterinary medical college.

Requests for information on pre-veterinary medical study programs and applications for admission to such programs should be addressed to the dean of either the College of Agriculture or the College of Arts and Sciences.

Listed below are the minimum course prerequisites for consideration for admission to the College of Veterinary Medicine.

- English composition and technical/professional report writing-eight semester credit hours.
- Chemistry-17 semester credit hours including five semester credit hours of organic chemistry designed for pre-veterinary, premedical and pre-dental students and must include both the alphabetic and aromatic series of organic compounds. Additionally four semester credit hours of biochemistry (three hours lecture and one hour laboratory) is required.
- Physics-eighth semester credit hours. Physics courses must include laboratory work and the following topics: mechanics, heat, sound, electricity, magnetism, light and modern physics.
- Mathematics-three semester credit hours. Mathematics courses must include the fundamental operations of algebra, exponents and radicals, simple equations, graphs, simultaneous equations, quadratic equations and logarithms.
- Biological science-15 semester credit hours. Courses in zoology, botany, microbiology and genetics are required. These courses must include laboratory work. Comprehensive courses in biology will be considered but must be evaluated before credit is accepted.
- Humanities and social science-Six semester credit hours.

Scholarships
The College has several scholarships which are available to veterinary medicine students, based on academic achievement and financial need. Special scholarships and awards are available for black students enrolled in veterinary medicine or in the pre-veterinary medicine program.

Veterinary Medical Studies
Entering classes in veterinary medicine are restricted in enrollment and are admitted once yearly at the beginning of the fall term. Applications for admission must be submitted by December 15. Applicants who are legal residents of Oklahoma will be given first priority. However, up to ten percent of the first-year students may be selected from a pool of nonresident applicants.

Questions about residency should be directed to the Office of Admissions, Oklahoma State University. Requests for application materials should be directed to the coordinator, Veterinary Medicine Admissions, College of Veterinary Medicine.

Students are admitted as candidates for the Doctor of Veterinary Medicine degree on the basis of records of academic performance in preparatory studies, standard achievement tests, and personal interviews and references to determine personal characteristics and career motivation.

The veterinary curriculum extends over four calendar years. The first two academic years conform to the normal semester system of the University. The last two academic years are continuous, the fourth starting shortly after the third, and organized into two-week periods, with sectioning of the classes to provide for lower faculty-student ratio and for more efficient utilization of clinical facilities.

Departmental Clubs and Honor Societies
American Veterinary Medical Association, Student Chapter
Society of Phi Zeta, Nu Chapter (academics and research)

Physiological Science
Professor and Interim Head Lloyd C. Faulkner, D.V.M., Ph.D.

Graduate Programs
The Department of Physiological Science offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy in physiological science. The programs are designed to prepare students for teaching and research positions in universities or colleges; research positions in governmental laboratories, foundations or industry and related positions. Areas of concentration offered are anatomy, pharmacology, physiology and toxicology.
Application Procedure. Applications are accepted at any time; however, in order to be considered for assistantships applications for enrollment in the summer session or fall semester should be received by February 15, and applications for enrollment in the spring semester should be received by September 15.

Review and formal acceptance or rejection of applications for admission to the graduate program in physiological science is delegated to the departmental graduate education committee. For admission to the graduate program the candidate must possess a bachelor's degree or higher in a science-related field with course work in mathematics, chemistry and physics.

Criteria for recommending admission are:
1. For candidates whose highest earned degree is the baccalaureate, the sum of verbal and quantitative scores on the Graduate Record Examination will be multiplied by the grade-point average on a four point scale, for the last 60 hours of undergraduate course work. The product score must be 3000 or greater for M.S. degree candidates or 3150 or greater for Ph.D. degree candidates for admission without qualification. Students who fail to meet these criteria may be considered for admission on a provisional basis.
2. For candidates with advanced degrees, medical degrees or degrees earned outside the United States, admission status will be evaluated on an individual basis.

Applicants are encouraged to select a major professor prior to admission to the departmental program. When this is not possible, two temporary advisers will be assigned by the graduate education committee. A permanent adviser should be chosen as soon as possible. When the student's graduate program adviser is determined, the department head in consultation with the adviser and the graduate education committee, will appoint a graduate advisory committee. This committee will consist of not fewer than three graduate faculty members for students pursuing the master's degree. Two of the committee members must be members of the graduate faculty of the Department of Physiological Science. For students pursuing the doctoral degree, a graduate advisory committee of not less than four graduate faculty members, one of whom must be from outside the departmental graduate faculty, will be appointed by the dean of the Graduate College upon recommendation of the graduate education committee. Functions of the advisory committee are described in the "Graduate College" section.

The Master of Science Degree. This degree may be earned in one of two ways: (1) completion of a total of 30 semester credit hours including 12 credit hours related to a thesis. The thesis must be formally submitted to the Graduate College for partial fulfillment of the requirements for the degree. (2) completion of a total of 32 semester credit hours including two credit hours in research and thesis. A report must be submitted to the Graduate College for partial fulfillment of the requirements for the degree. The student must present her or his thesis or report in a seminar to the Department and pass a final oral examination at that time. The courses forming the student's program are determined by the student's graduate advisory committee in conference with the student.

The Doctor of Philosophy Degree. Students may enter the doctoral program without first acquiring a master's degree. The course requirement for the Ph.D. is 90 semester credit hours including a minimum of 30 credits for research and thesis. The courses required are determined by the graduate advisory committee in conference with the student. The 90 semester credit hours may include all or a part of the work completed for a master's degree. The student must pass written and oral qualifying examinations. A thesis or doctoral dissertation based on original research must be accepted by the graduate advisory committee and submitted to the Graduate College. The student must present his or her dissertation in a seminar to the department and pass a final oral examination at that time.

Minor in Physiological Science. A graduate student working toward a Ph.D. who wishes to declare a minor in physiological science is expected to have a member of the Department on his or her graduate advisory committee, must meet the Graduate College requirements for a minor, and have a minimum of 14 credit hours in physiological science including six credit hours of mammalian physiology (4000 level or higher).

Veterinary Medicine and Surgery

Professor and Head Grant H. Turnwald, B.V.Sc., M.S.

Graduate Programs

The Department offers graduate professional programs (internships and residencies). Internships are one-year post-D.V.M. clinical programs in small or large animal medicine and surgery. Residencies are three-year clinical programs in various disciplines designed in part to prepare for specialty board certification. Graduate academic programs in other departments are offered in association with some residencies.

Application Procedure. Applications are accepted at any time and will be considered as positions become available.

Veterinary Parasitology, Microbiology and Public Health

Professor and Head Robert W. Fulton, D.V.M., Ph.D.

Graduate Programs

The Department of Veterinary Parasitology, Microbiology and Public Health offers a program of research and study leading to the degrees of Master of Science and Doctor of Philosophy with specialization in the areas of veterinary hematology, protozoology, bacteriology, virology, immunology, epidemiology and public health. The program is designed to prepare individuals for careers in teaching and research, and is flexible to meet the needs of the student within the capabilities of the Department and the University.

Application Procedure. Applications are accepted at any time; however, all documents must be received prior to March 1 for admission to the summer session, July 1 for the fall semester, and November 1 for the spring semester. Applicants are required to submit scores for the Aptitude Test portion of the Graduate Record Examination. (The Advanced Test in Biology is also suggested.) International applicants are required to take the English Proficiency Exam (TOEFL; a passing score is 550 or above), as well as the Test of Spoken English (TSE: a passing score is 220 or above), before they can be considered for graduate teaching assistantships unless they are from a country where English is a first language.

Applicants generally select a major professor before they are admitted to the departmental program. They are urged to correspond with a member of the department's graduate faculty whose interests reflect their own before making application. Information about the faculty's research interests is available upon written request to the Department. After acceptance to the graduate program, the department head recommends an advisory committee to the dean of the Graduate College to develop a plan of study.

Prerequisites. Candidates for admission must possess a bachelor's degree or equivalent, including 30 semester credit hours in biological and physical sciences. Unqualified admission will be granted only to those applicants with combined verbal and quantitative GRE total score multiplied by their GPA (last 60 hours) totaling 3000 or greater. Provisionary status may be awarded to those not having these credentials with specific requirements dependent on recommendations of the departmental graduate faculty.

The Master of Science Degree. The M.S. must be earned by either Plan I, with thesis, 30 credit hours, including not more than six credit hours for the thesis, or Plan II, with report, 32 credit hours, including not more than two credit hours for the report. The plan of study will be tailored to meet the student's needs and interests; however, all students must enroll in Seminar (VCPA 6110) for one credit hour, and must pass three credit hours of biochemistry acceptable for graduate credit, and a course in statistical methods. The student must also pass a final oral examination covering the thesis or report and related course work.

The Doctor of Philosophy Degree. The Ph.D. requires a total of 90 credit hours beyond the B.S. degree. All Ph.D. students must enroll in Seminar (VCPA 6110) for two hours of graduate credit and, if not already complete, must fulfill the requirements for biochemistry and statistical methods detailed above under "Master of Science Degree." A written and oral qualifying examination is required. Students must prepare a research proposal and complete a dissertation based on original research. The final examination is oral and is based primarily on the dissertation problem although not limited to this subject.

Veterinary Pathology

Professor and Head Anthony W. Welter, D.V.M., Ph.D.

Graduate Programs

The Department offers a program of research and study leading to the degrees of Master of Science and Doctor of Philosophy in veterinary pathology. The course work required depends on
the needs and background of the individual student. Most persons who undertake a program will have a professional degree in veterinary medicine. The programs, specializing in either anatomic or clinical pathology, are designed to prepare individuals for careers in teaching, research, and service pathology as required to fulfill the requirements of animal disease diagnostic facilities and industry.

**Application Procedure.** Applications are accepted at any time. Applicants should submit college transcripts and Graduate Record Examination scores.

**Prerequisites.** It is highly desirable that candidates for admission possess the Doctor of Veterinary Medicine or equivalent degree. Only in exceptional circumstances will applicants not possessing a medical degree be admitted. Such individuals must possess a bachelor's degree or equivalent and a strong background in biological and medical sciences. Approval for admission can be given only by the department head.
Faculty

COLLEGE OF AGRICULTURE

Agricultural Communications
Associate Professor and Head Kevin G. Hayes, M.A.
(See “Journalism and Broadcasting” in the “College of Arts and Sciences” for staff.)

Agricultural Economics
Professor and Head James E. Osborn, Ph.D.

Agricultural Education
Professor and Head H. Robert Terry, Ph.D.

Agricultural Engineering
Professor and Head David R. Thompson, Ph.D.

Agriculture (General)
Professor and Associate Dean Paul D. Hummer, Ph.D.

Agronomy
Professor and Head Charles J. Scifres, Ph.D.

Animal Science
Professor and Head Robert Totusek, Ph.D.
Professor and President John R. Campbell, Ph.D.
Professor, Dean and Director, Division of Agriculture Charles B. Browning, Ph.D.
Professor and Associate Director, Oklahoma Agricultural Experiment Station, Ronald R. Sauer, Ph.D.


Biochemistry
Professor and Head Roger E. Koeppke, Ph.D.
Regents Professor Chang-An Yu, Ph.D.
Professors Margaret K. Eisenberg, Ph.D.; Richard C. Essenberg, Ph.D.; Robert K. Gholson, Ph.D.; Franklin R. Leach, Ph.D.; Ulrich K. Melcher, Ph.D.; Earl D. Mitchell, Ph.D.; Eldon C. Nelson, Ph.D.; George V. Odell, Ph.D.; H. Olin Spivey, Ph.D.; George R. Waller, Ph.D.; Linda Yu, Ph.D.; Associate Professor Andrew J. Mort, Ph.D.; Assistant Research Professors S. Kay Nida, Ph.D.; Margaret Pierce, Ph.D.; Instructor Judy A. Hall, M.S.

Entomology
Professor and Interim Head Russell E. Wright, Ph.D.
Associate Professors Robert W. Barker, Ph.D.; Gerrit W. Cuperman, Ph.D.; W. Scott Fargo, Ph.D.; James A. Webster, Ph.D.  
Assistant Professors Bobby D. Cartwright, Ph.D.; Jack W. Dillworth, Ph.D.  

Forestry  
Associate Professor and Head Edwin L. Miller, Ph.D.  
Professors David W. Robinson, Ed.D.; Charles G. Tauer, Ph.D. **Associate Professors**  
Charles T. Hennessey, Ph.D.; David K. Lewis, D.Phil.; Robert F. Wittwer, Ph.D.  
Assistant Professors Steven Anderson, Ph.D.; Stephen W. Hallgren, Ph.D.; Thomas B. Lynch, Ph.D.  
Instructor Thomas Kuzmic, M.S.  

Horticulture and Landscape Architecture  
Professor and Head Dale M. Maronek, Ph.D.  
Professors James E. Motes, Ph.D.; Michael W. Smith, Ph.D.; Glenn G. Taylor, Ph.D. **Associate Professors**  
Brian A. Kahn, Ph.D.; Charles A. Leider, M.C.P.; B. Dean McCraw, Ph.D.; Paul J. Michel, M.S.  
Instructors Kathryn Crewe, B.L.A.; Mary Ann Schwartz, Ph.D.  

Plant Pathology  
Professor and Head Larry J. Littlefield, Ph.D.  
Professors Kenneth E. Conway, Ph.D.; Francis J. Gough, Ph.D.; Hassan A. Melouk, Ph.D.; Charles C. Russell, Ph.D. **Associate Professors**  
Jacqueline Fletcher, Ph.D.; Robert M. Hunger, Ph.D.; Robert C. Nutter, Ph.D.; John L. Sherwood, Ph.D.; Larry L. Singleton, Ph.D.; Ervin Williams, Jr., Ph.D.  
Instructors Professor Carol L. Bender, Ph.D.; Alexander B. Filonow, Ph.D.  

**COLLEGE OF ARTS AND SCIENCES**  

Art  
Professor and Head Richard A. Bivins, M.F.A.  
Professor Larry C. Avrett, M.F.A. **Associate Professors**  

Botany and Microbiology  
Professor and Head Glenn W. Todd, Ph.D.  
Professors Becky B. Johnson, Ph.D.; James K. McPherson, Ph.D.; James D. Omby, Ph.D.; Paul E. Richardson, Ph.D.; Ronald J. Tyrl, Ph.D. **Associate Professors**  
David A. Francko, Ph.D.; David W. Minike, Ph.D.  
Assistant Professor Arnon Rikin, Ph.D.  

**Chemistry**  
Professor and Head Neil Purdue, Ph.D.  
**Regents Professor**  
Gordon K. Darrin Berlin, Ph.D.; Lionel M. Raff, Ph.D. **Associate Professors**  
Professors Richard A. Bunce, Ph.D.; John I. Gelder, Ph.D.  
Assistant Professors Christopher M. Adams, Ph.D.; Paul W. Geno, Ph.D.; Ziad El Rassi (visiting); S. Daryl Larson, Ph.D. **(adjunct)**  
Mabel R. Stephane, B.S.  

Computing and Information Science  
Professor and Head George E. Hedrick, Ph.D.  
**Professor Rector L. Page, Ph.D. (adjunct)**  
**Associate Professors**  
Assistant Professors Huizhu Lu, Ph.D. **(visiting)**; Blayne E. Mayfield, Ph.D.; William D. Miller, Ph.D. **(visiting)**; Mansur H. Samadzadeh, Ph.D.; Lan Yang, Ph.D. **(visiting)**  
Lecturer Faridah Samadzadeh, M.S.  

**English**  
**Associate Professor and Interim Head Edwar D. Walkiewicz, Ph.D.**  
**Professors Mary H. Rohrberger, Ph.D.; Peter C. Rollsion, Ph.D.; Thomas L. Warren, Ph.D.; Gordon D. Samuel H. Woods, Ph.D.** **Associate Professors**  
Richard Battaige, Ph.D.; Leonard Leff, Ph.D.; Margaret Nelson, Ph.D.; William Pixton, Ph.D.; Ravi Sheorey, Ph.D.; Bruce Southard, Ph.D.; Sherry Southard, Ph.D.; Jeffrey Walker, Ph.D. **Assistant Professors**  
Nuala Archer, Ph.D.; Joel Athey, Ph.D.; Linda Austin, Ph.D.; Randi Eldevik, Ph.D.; Elizabeth Grubgeld, Ph.D.; Edward Jones, Ph.D.; Linda Leavell, Ph.D.; Carol Moder, Ph.D.; Martin Wallen, Ph.D.; Samuel Whitsitt, Ph.D.  

Foreign Languages and Literatures  
**Professor and Head John A. Schillinger, Ph.D.**  
**Professors Santiago Garcia, Ph.D.; Harry S. Wohletz, Ph.D.** **Associate Professors Cida S. Chase, Ph.D.; Kenneth J. Dollarhide, Ph.D.; John J. Deveny, Jr., Ph.D.; Perry J. Garner, Ph.D.; Paul Y. Lin, Ph.D.; Juan M. Marcos, Ph.D.; Dorothy Schrader, Ph.D.; James D. Wells, M.A.**  
**Assistant Professors Paul D. Epstein, Ph.D.; John J. Howland, Ph.D.; David A. Patterson, Ph.D.** **Instructors**  
Dora M. Deveny, M.S.Ed.; Hildegund Wohletz, M.A.  

**Geography**  
**Professor and Head Richard D. Heckow, Ph.D.**  
**Professors George O. Carney, Ph.D.; Robert E. Norris, Ph.D.; John F. Rooney, Ph.D.** **Associate Professors Jerry D. Crotf, Ed.D.; Stephen J. Studler, Ph.D.; Stephen W. Tweedie, Ph.D.** **Assistant Professors**  
James Curtis, Ph.D.; Louis Seig, Ph.D. **Instructor**  
M. Richard Hackett, M.A.  

**School of Geology**  
**Sun Chair and Head Wayene A. Pettyjohn, Ph.D.**  
**Associate Professors Ibrahim Cemen, Ph.D.; Arthur Cleaves, Ph.D.**  
**Visiting Assistant Professor**  
Scott M. Ritter, Ph.D.  

**School of Health, Physical Education and Leisure**  
**Professor and Director George H. Oberle, Ph.D.**  
**Professor and Coordinator, Health James H. Rogers, Ph.D.**  
**Associate Professor and Coordinator, Leisure and Coordinator of Graduate Studies Lowell Canaday, Ph.D.**  
**Associate Professor and Coordinator, Physical Education Sandra K. Gangstead, Ph.D.**  
**Assistant Professors Chris Arigo, M.S., A.T.C.; Karin Debenedetti, M.A.; Margaret Rebenar, B.S.** **Lecturer Merrilynn Hartman, M.S.** **Academic Counselor Dorothy Rogers, M.S.**  

**History**  
**Associate Professor and Head Dr. Roger Biles, Ph.D.**  

**School of Journalism and Broadcasting**  
**Assistant Professors Terry M. Clark, M.A.; Lionel D. Cooper, Jr., Ph.D.; Donald Forbes, M.S.; Brooks Garner, M.S.; Donald E. Mendenhall, M.S.; Geoffrey Stenfaniak, Ph.D.** **Assistant Professor Barbara Webb, J.D.**, Lecturers Jean Devlin, B.S.; Sharon Iorio, M.S.; Gene Post, Ed.D.; Keith Swzezy, B.S.; Susan Tomlison, M.S.  

**Mathematics**  
**Professor and Head Marvin S. Keener, Ph.D.** **Professor and Associate Head Dennis Berthoff, Ph.D.**  
Professors and Head Anne L. Schneider, Ph.D.

Professors Robert Darcy, Ph.D.; Bertil L. Harlin, Ph.D.; James L. Lawler, Ph.D., J.D.; Robert L. Spurrur, Jr., Ph.D.


Assistant Professors David Billeaux, Ph.D.; James A. Davis, Ph.D.; Joel M. Jenswald, Ph.D.

Instructor Danny M. Adikson, Ed.D.

Psychology

Associate Professor and Head Vicki Green, Ph.D.


Associate Professors Brian Dougherty, Ph.D.; Larry Hochhaus, Ph.D.; James Price, Ph.D.; Bill C. Scott, Ph.D.; Assistant Professors Joan Holloway, Ph.D.; Daniel W. McNeil, Ph.D.

David Thomas, Ph.D.

Academic Counselor Carolyn Gang, M.S.; Coordinator, Minority Graduate Student Service Molly Tovar, M.A.T.

Religious Studies

Adjunct Assistant Professor William Ivy, Ph.D.

Professors Azim A. Nani, Ph.D.; Theodore Vestal, Ph.D. (visiting)

Associate Professor James S. Thayer, Ph.D.

Assistant Professor Charles Cufi (visiting)

Sociology

Professor and Head Charles Edgley, Ph.D.

Professors Donald Brown, Ph.D.; Jack Bynum, Ph.D.; Richard Dodder, Ph.D.;

Larry Perkins, D.S.S.; Harjit Sandhu, Ph.D.

Associate Professors George Arquitt, Ph.D.; Patricia Bell, Ph.D.; Larry Hynson, Ph.D.; Kenneth Kier, Ph.D.

Assistant Professors Lynn Atkinson, Ph.D.; John Cross, Ph.D.; David Knott, Ph.D.; Keith Moore, Ph.D.; Carol Olson, Ed.D. (adjunct)

Academic Counselor Georgia Hecock, M.A.

Speech Communication

Associate Professor and Interim Head Paul D. Harper, Ph.D.

Professor James Hughey, Ph.D.

Associate Professor Mike Stano, Ph.D.

Assistant Professors Bena Harper, Ed.D; William Morphis, M.A.

Jeffrey McCullion, Ph.D.

Speech and Language

Pathology and Audiology

Professor and Head John M. Panagos, Ph.D.

Associate Professors Nancy Monroe, Ph.D.; Arthur L. Pentz, Ph.D.; Cheryl Scott, Ph.D.

Associate Professor Gary J. Beery, M.A.

Instructors Ann Davidson, M.A.; Carol Headrick, M.C.D.; Jan Marks, M.S.; Susan Richardson, M.S.

Statistics

Professor and Head J. Leroy Folks, Ph.D.

Professors P. Larry Clappool, Ph.D.; Robert Darcy, Ph.D.;

Richard Dodder, Ph.D.; Ignacy I. Kotlarzki, Ph.D.; Ronald W. McNew, Ph.D.;

David L. Weeks, Ph.D.

Associate Professor Linda J. Willson, Ph.D.; Assistant Professors Barry K. Moser, Ph.D.; Gary F. Stevens, Ph.D.

Instructor Brenda J. Masters, M.S.

Theater

Professor and Head Kenneth Cox, Ph.D.

Professor Jerry L. Davis, Ph.D.

Associate Professor Mary Anne Hempe, M.F.A.

Assistant Professors Tracy Callahan, M.F.A.; Heidi Hoffer, M.F.A.; Alex Pinkston, Ph.D.

Peter Westerhoff, M.F.A.

Zoology

Professor and Head Jerry Wilhm, Ph.D.

Professors John Bantle, Ph.D.; Calvin Beames, Jr.; Ph.D.; L. Herbert Brneau, Ph.D.; Sterling Burks, Ph.D.; H. James Harmon, Ph.D.; Rudolph Miller, Ph.D.;

James Shaw, Ph.D.; John Thornton, Ph.D.;

Dale Toetz, Ph.D.;

Assistant Professors Kevin K. Jin-Joo Song, Ph.D.;

William A. Sibley, Ph.D.; Jin-Joo Song, Ph.D.

Assistant Professors Michele A. Hartman, Ph.D.;

H. James Harman, Ph.D.; Rudolph Miller, Ph.D.

Assistant Professors James Blankmeyer, Ph.D.; Tracy Carter, Ph.D. (visiting)

Anthony Echelle, Ph.D.;

Margaret S. Ewing, Ph.D.;

Stanley K. Ph.D.; Jerry Hurst, Ph.D.;

Helen Miller, Ph.D.;

Larry Tal- ent, Ph.D.;

Alexander Zale, Ph.D. (adjunct)

Assistant Professors David Leslie, Ph.D. (adjunct)

James Lish, Ph.D. (adjunct)

Robert Loichmiller, Ph.D.;

Karen McBee, Ph.D.; Deborah Meinke, Ph.D. (adjunct)

COLLEGE OF BUSINESS ADMINISTRATION

School of Accounting

Professor and Head L anni G. Chasteen, Ph.D., CPA

Professors Don R. Hansen Ph.D., CMA; Dennis H. Patz, Ph.D., CPA

Associate Professors Dale E. Armstrong, Ph.D., CPA; Patrick B. Dorr, Ph.D., CPA; Lawrence H. Hammer, D.B.A., CPA; Janet I. Kimberl, Ph.D., CPA; M.E., CPA; Amy H. Lau, Ph.D., CPA; Gary K. Meek, Ph.D., CPA; Maryanne M. Mowen, Ph.D., CPA; Kevin E. Murphy, Ph.D., CPA; Charles R. Ransoms, Ph.D., CPA; John W. Wilguss, Ph.D., CPA; Charlotte J. Wright, Ph.D.

CPA Assistant Professors R. Dan Edwards, Ph.D.; James E. Groff, Ph.D.

Michael F. Thomas, Ph.D.; Thomas S. Wetzel, Ph.D.

Administrative Services

Professor and Head Joe W. Fowler, J.D.

Professors John T. Bale, Jr., Ed.D.; Dennis L. Mott, Ed.D.; Zane K. Quible, Ph.D.

Associate Professors Jane N. Hammer, Ed.D.; Jeanine D. Rhea, Ed.D.

Assistant Professors James F. Jackman, J.D.; Tipton F. McCubbins, J.D.; Greg Mosier, Ed.D., J.D.;

Andrew L. Urich, J.D.

Business Administration

M.B.A. Program Director Cynthia S. Gray

Economics

Professor and Head Ronald L. Moomaw, Ph.D.

Professors Orley M. Amos, Jr., Ph.D.; Robert C. Dauffenbach, Ph.D.; Michael R. Edgmond, Ph.D.; Joseph M. Jadlow, J.D., Ph.D.;

Gerald M. Lange, Ph.D.; Kent W. Olson, Ph.D.;

Richard W. Poole, Ph.D.; Donald R. Sardmeyer, Ph.D.;

Joseph Shua, Jr., Ph.D.;

Associate Professors Frank G. Steindl, Ph.D.;

Larkin B. Warner, Ph.D., CPA

Maryanne M. Mowen, Ph.D., CPA

Kevin E. Murphy, Ph.D., CPA

Charles R. Ransoms, Ph.D., CPA

John W. Wilguss, Ph.D., CPA

Charlotte J. Wright, Ph.D.

CPA Assistant Professors R. Dan Edwards, Ph.D.; James E. Groff, Ph.D.

Michael F. Thomas, Ph.D.; Thomas S. Wetzel, Ph.D.

Administrative Services

Professor and Head Joe W. Fowler, J.D.

Professors John T. Bale, Jr., Ed.D.; Dennis L. Mott, Ed.D.; Zane K. Quible, Ph.D.

Associate Professors Jane N. Hammer, Ed.D.; Jeanine D. Rhea, Ed.D.

Assistant Professors James F. Jackman, J.D.; Tipton F. McCubbins, J.D.; Greg Mosier, Ed.D., J.D.;

Andrew L. Urich, J.D.

Business Administration

M.B.A. Program Director Cynthia S. Gray

Economics

Professor and Head Ronald L. Moomaw, Ph.D.

Professors Orley M. Amos, Jr., Ph.D.; Robert C. Dauffenbach, Ph.D.; Michael R. Edgmond, Ph.D.; Joseph M. Jadlow, J.D., Ph.D.;

Gerald M. Lange, Ph.D.; Kent W. Olson, Ph.D.;

Richard W. Poole, Ph.D.; Donald R. Sardmeyer, Ph.D.;

Joseph Shua, Jr., Ph.D.;

Associate Professors Frank G. Steindl, Ph.D.;

Larkin B. Warner, Ph.D., CPA

Maryanne M. Mowen, Ph.D., CPA

Kevin E. Murphy, Ph.D., CPA

Charles R. Ransoms, Ph.D., CPA

John W. Wilguss, Ph.D., CPA

Charlotte J. Wright, Ph.D.

CPA Assistant Professors R. Dan Edwards, Ph.D.; James E. Groff, Ph.D.

Michael F. Thomas, Ph.D.; Thomas S. Wetzel, Ph.D.
Finance

Professor and Head W. Gary Simpson, Ph.D.

Associate Professors James F. Jackson, Jr., Ph.D.; Ronald K. Barr, Ph.D., Assistant

Professors Mary S. Broske, Ph.D.; Janice N. Jadowski, Ph.D.; John Polonchek, Ph.D.; John R. Wingender, Ph.D.

Management

Professor and Head Wayne A. Meinhardt, Ph.D.

Regents Professor Hon-Shiang Lau, Ph.D.

Professors Richard A. Aukerman, Ph.D.; G. Daryl Nord, Ph.D.; Thomas H. Stone, Ph.D.; J. Scott Turner, Ph.D., Associate

Professors Steven H. Barr, Ph.D.; David G. Ho, Ph.D.; Tim C. Ireland, Ph.D.; Marilyn G. Kletke, Ph.D.; Chalmer E. Labig, Jr., Ph.D.; Jeretta A. Nord, Ed.D., Ed.M.; Ramesh Shards, Ph.D., Assistant


Marketing

Associate Professor and Interim Head Raymond F. Fisk, D.B.A.


Professors Ruth H. Kriegier, Ph.D.; Raymond W. LaForge, D.B.A.; L. Lee Manzer, Ph.D.; Joshua L. Wiener, Ph.D.; Clifford E. Young, Ph.D.

Professors Jerry R. Goosby, Ph.D.; James Thomas, Ph.D.; Ajay Sukhdial, M.B.A.

COLLEGE OF EDUCATION

Applied Behavioral Studies

Professor and Head Dale R. Fuqua, Ph.D.

Professors Kay S. Bull, Ph.D.; N. Jo Campbell, Ed.D.; Judith E. Dobson, Ph.D.; Rondal R. Gamble, Ph.D.; James M. Seals, Ph.D.; Paul G. Warden, Ph.D., Associate


Professors Marcia M. Dickman, Ph.D.; Nancy Fagley, Ph.D.; Pamela L. Knox, Ph.D.; Dorothy A. Strom, Ph.D.; Janice E. Williams, Ph.D., Adjunct Assistant


Aviation and Space Education

Professor and Head Kenneth E. Wiggins, Ed.D.

Adjunct Assistant Professors Malcolm V. Phelps, M.S.; Gregory Vogt, M.S.


Curriculum and Instruction

Professor and Head Douglas B. Aichele, Ed.D.


Educational Administration

Professor and Head Thomas A. Karman, Ph.D.


School of Occupational and Adult Education

Professor and Director Melvin D. Miller, Ed.D.


COLLEGE OF ENGINEERING, ARCHITECTURE AND TECHNOLOGY

Agricultural Engineering

Professor and Head David R. Thompson, Ph.D.


School of Architecture

Professor and Head Virgil R. Carter, M.Arch., FAIA


Chemical Engineering

Regents Professor and Head Robert L. Robinson, Jr., Ph.D.

Regents Professor Kenneth J. Bell, Ph.D., P.E. Professors Marvin M. Johnson, Ph.D. (adjunct); Mayis Seapan, Ph.D., Jan Wagner, Ph.D., P.E. Associate Professors Gary L. Poul In, Ph.D.; A. H. Johannes, Ph.D., P.E.; William E. Payne (adjunct) Assistant Professors Ruth C. Erbar, Ph.D., P.E. Khaled A.H. Gasem (visiting)

Civil Engineering

Professor and Head Robert K. Hughes, Ph.D., P.E.


Electrical and Computer Engineering

Professor and Head James Baker, Ph.D., P.E.


General Engineering

Professor and Head Bennett L. Basore, Sc.D., P.E.

Industrial Engineering and Management

Professor and Head Carl B. Estes, Ph.D., P.E. Regents Professors Kenneth E. Case, Ph.D., P.E.; Joe H. Han, Ph.D., P.E., Associate Professors Allen C. Schuermann, Ph.D., P.E.; James E. Shamlum, Ph.D., P.E.; M. Palmer Terrell, Ph.D., P.E.; Wayne C. Turner, Ph.D., P.E. Associate Professors Michael H. Bradson, Ph.D., P.E.; David E. Mandeville, Ph.D.; John W. Nazemetz, Ph.D.

Mechanical and Aerospace Engineering

Professor and Head Lawrence L. Hoberock, Ph.D., P.E.
Ph.D.; Alastair G. Watson, B.V.Sc., Ph.D.
Assistant Professors Cyril R. Clarke, B.V.Sc., Ph.D. (visiting); Bruce A. Lessley, Ph.D.; Joseph P. McCann, Ph.D.

Veterinary Medicine and Surgery
Professor and Head *Grant H. Turnwald, B.V.Sc., M.S.
Instructors Sharon L. Nash, D.V.M.; Carolyn L. Taylor-MacAllister, D.V.M.

Veterinary Parasitology, Microbiology and Public Health
Professor and Head *Robert W. Fulton, D.V.M., Ph.D.
Regents Service Professor *Patrick M. Morgan, D.V.M., Dr. P.H.
Associate Professors J. Carl Fox, Ph.D.; John T. Homer, Ph.D.; C. Sidney S. McCain, D.V.M., M.S.
Visiting Assistant Professor Louis J. Perino, D.V.M.

Veterinary Pathology
Professor and Head Anthony W. Confer, D.V.M., Ph.D.
Associate Professors Ray Ely, D.V.M., Ph.D. (adjunct); Katherine M. Kocan, M.S.P.H., Ph.D.; Ronald D. Tyler, D.V.M., Ph.D.

Oklahoma Animal Disease Diagnostic Laboratory
Director Dan E. Goodwin, D.V.M., Ph.D.
Assistant Director and Chief Pathologist *E. L. Stair, D.V.M., Ph.D.

*Board Certification in Specialty Area
Graduate College

Graduate College Calendar

(Refer also to the "University Calendar")

Summer 1989

June 5, Monday
Class work begins
June 9, Friday
Last day to file a diploma application
June 9, Friday
FINAL DRAFT copy of dissertations, theses and reports due

Second Semester-1989-90, Spring

January 8, Monday
Class work begins
January 19, Friday
Last day to file a diploma application
February 16, Friday
Applications for graduate credit for graduating seniors due
March 23, Friday
FINAL DRAFT copy of dissertations, theses and reports due
April 6, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
April 20, Friday
FINAL COPIES of dissertations, theses and reports due by spring candidates
April 27, Friday
Application for admission to fall candidacy due for doctoral and Ed.S. candidates
May 4, Friday
Class work ends
May 4, Friday
Graduate College Hooding Convocation
May 5, Saturday
University Commencement

Summer 1990

Regular 8-week Summer Session

June 4, Monday
Class work begins
June 8, Friday
Last day to file a diploma application
June 8, Friday
FINAL DRAFT copy of dissertations, theses and reports due
June 15, Friday
Applications for graduate credit for graduating seniors due
June 22, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
July 6, Friday
FINAL COPIES of dissertations, theses and reports due by summer candidates
July 20, Friday
Graduate College Hooding Convocation
July 30, Monday
Class work ends (makeup exams)

First Semester-1990-91, Fall

August 27, Monday
Class work begins
September 7, Friday
Last day to file a diploma application
September 28, Friday
Applications for graduate credit for graduating seniors due
November 9, Friday
FINAL DRAFT copy of dissertations, theses and reports due
November 9, Friday
Application for admission to spring candidacy due for doctoral and Ed.S. candidates
November 23, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATION due
December 7, Friday
FINAL COPIES of dissertations, theses and reports due by fall candidates
December 16, Sunday
Graduate College Hooding Convocation
December 21, Friday
Class work ends

Second Semester-1990-91, Spring

January 14, Monday
Class work begins
January 25, Friday
Last day to file a diploma application
February 15, Friday
Applications for graduate credit for graduating seniors due
March 29, Friday
FINAL DRAFT copy of dissertations, theses and reports due
April 12, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
April 26, Friday
FINAL COPIES of dissertations, theses and reports due by spring candidates
April 26, Friday
Application for admission to fall candidacy due for doctoral and Ed.S. candidates
May 10, Friday
Class work ends
May 10, Friday
Graduate College Hooding Convocation
May 11, Saturday
University Commencement

First Semester-1990-91, Fall

August 27, Monday
Class work begins
September 7, Friday
Last day to file a diploma application
September 28, Friday
Applications for graduate credit for graduating seniors due
November 9, Friday
FINAL DRAFT copy of dissertations, theses and reports due
November 9, Friday
Application for admission to spring candidacy due for doctoral and Ed.S. candidates
November 23, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATION due
December 7, Friday
FINAL COPIES of dissertations, theses and reports due by fall candidates
December 16, Sunday
Graduate College Hooding Convocation
December 21, Friday
Class work ends

Second Semester-1990-91, Spring

January 14, Monday
Class work begins
January 25, Friday
Last day to file a diploma application
February 15, Friday
Applications for graduate credit for graduating seniors due
March 29, Friday
FINAL DRAFT copy of dissertations, theses and reports due
April 12, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
April 26, Friday
FINAL COPIES of dissertations, theses and reports due by spring candidates
April 26, Friday
Application for admission to fall candidacy due for doctoral and Ed.S. candidates
May 10, Friday
Class work ends
May 10, Friday
Graduate College Hooding Convocation
May 11, Saturday
University Commencement

Graduate College Hooding Convocation

Second Semester-1990-91, Spring

January 8, Monday
Class work begins
January 19, Friday
Last day to file a diploma application
February 16, Friday
Applications for graduate credit for graduating seniors due
March 23, Friday
FINAL DRAFT copy of dissertations, theses and reports due
April 6, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
April 20, Friday
FINAL COPIES of dissertations, theses and reports due by spring candidates
April 27, Friday
Application for admission to fall candidacy due for doctoral and Ed.S. candidates
May 4, Friday
Class work ends
May 4, Friday
Graduate College Hooding Convocation
May 5, Saturday
University Commencement

Summer 1990

Regular 8-week Summer Session

June 4, Monday
Class work begins
June 8, Friday
Last day to file a diploma application
June 8, Friday
FINAL DRAFT copy of dissertations, theses and reports due
June 15, Friday
Applications for graduate credit for graduating seniors due
June 22, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due
July 6, Friday
FINAL COPIES of dissertations, theses and reports due by summer candidates
July 20, Friday
Graduate College Hooding Convocation
July 30, Monday
Class work ends (makeup exams)
The Graduate College

The Graduate College is the hub of advanced study, research and creativity at Oklahoma State University. Faculty and students share an obligation to achieve greater knowledge and to present it to the scholarly community. Research is best done in an atmosphere where common goals exist. An esprit de corps exists in the OSU academic community where the goals are to maintain regional and national recognition, to provide an exciting research environment where students and faculty can make significant contributions to the store of knowledge, and to encourage each individual to reach his or her potential.

Organization of the Graduate College

The Graduate College administers regulations and standards specified and established by the Graduate Faculty. The Graduate council is elected by the Graduate Faculty to work with the dean of the Graduate College in development and administration of policy. The Graduate Council is the executive committee of the Graduate Faculty. It formulates and reviews policies concerned with the conduct of graduate study at OSU. All new policies are referred to the Graduate Faculty for approval.

All departmental requests for permission to offer advanced degrees are referred to the Graduate Council and then to the Graduate Faculty with the Graduate Council's recommendations.

All requests for waiver or any rules or regulations as listed in the Catalog must be in the form of petitions to the Graduate Council. A supporting letter from the major adviser is also required.

Graduate Council Members

Norman N. Durham, Chairman
Elaine Jorgenson, Vice-Chairman (1989)

Group I-Biological Sciences
1989-Russell Wright
1991-Laval Verhalen
1989-Charlotte Ownby

Group II-Humanities
1990-Art Pentz
1992-Thomas Warren
1990-Linda Leavall

Group III-Physical Sciences and Technology
1989-Allan Kelly
1991-Leroy Folks
1989-Mark Samuel

Group IV-Social Sciences
1990-Daniel Tilley
1992-Richard Dodder
1990-Bob England

Group V-Teacher Education
1989-N. Jo Cambell
1991-Zane Quible
1989-Anna Gorman

Research at Oklahoma State University

Research, a critical dimension of the mission of the University, is vital to the growth, health and progress of the state, the region and the nation. Over the last several years, national attention has turned to economic development. This renewed emphasis on economic development and high technology has been spurred by the advances made by the Asian and European economic communities. OSU is deeply involved in meeting this challenge. In recent years, significant strides have been taken in developing programs at the cutting edge of technology and basic research. The progress made by the establishment of the Noble Research Center for Agriculture and Renewable Natural Resources, the International Trade Development Center, and the ongoing activities of the Laser Materials Center, the robotics and automated manufacturing laboratories, and the biotechnology programs underscore the University's commitment to find solutions to pressing problems.

The University Center for Water Research (UCWR) coordinates programs associated with the Oklahoma Water Resources Research Institute, the Water Research Center and the National Center for Ground Water Research. The UCWR assists researchers in staying on the frontiers of water research by providing critical support and services.

The University Center for Energy Research facilitates and promotes multidisciplinary activities addressing the complex problems in the energy field. It provides funding to initiate and encourage energy-related research. Areas emphasized include fossil fuels, policy and other energy research.

The telecommunications Center has established the University as a world leader in telecommunications technology and has enhanced OSU's ability to disseminate research results. Major research affiliations exist with the National Center for Groundwater Research, Oak Ridge Associated Universities and National Laboratories, and the Oklahoma Medical Research Foundation. Research facilities exist within each of the academic colleges. Well-equipped laboratories, teaching and diagnostic facilities, and various resource centers provide an excellent environment for creative scholarly research.

University Research Council. The University Research Council operates to assure proper consideration of research projects that are multidisciplinary in nature and to provide a mechanism for consideration of administrative problems and policies. The Council serves as an advisory group on all research matters for the president of the University. This Council is composed of the assistant vice-president for research, the dean of the Graduate College, the director of University Extension, a representative of the Faculty Council, a representative from Sigma Xi, the director of Grants and Contracts Administration, and the research directors of the various colleges. The Research Council meets quarterly.
Research Centers

Agriculture Experiment Station 139 Agricultural Hall 744-5398
Agronomy Research Station 101 Agricultural Hall 744-7036
Caddo Research Station R.R. Box 42 643-2501
Eastern Research Station Fort Cobb, OK 73738 918-482-3822
Irrigation Research Station Rt. 1, Box 65A 918-286-5175
Kiamichi Field Station Altus, OK 73521 796-2447
North Central Research Station Box 141 505 Engineering North 744-6049
Pecan Research Station Rt. 1, Box 228 787-2046
Sandyland Research Station Mangum, OK 73554 918-866-2263
Southeast Center Lane, OK 74555 787-2046
South Central Research Station Rt. 3, Box 75 224-4476
Southwest Agronomy Research Station Tipton, OK 73570 482-3459
Noble Research Center for Agriculture and Renewable Natural Resources Rt. 3, Box 20 918-369-2441
Vegetable Research Station Bixby, OK 74008 744-7015
Center for Aerospace Education Services Project 300 North Cordell 744-5178
Center for Applications and Remote Sensing 107 Thatcher Hall 744-5900
Center for Automated Design and Manufacturing 218 Engineering North
Center for Consumer Services 016 Home Economics West 744-7084
Center for Economic Education 112 Business Building 744-5204
Center for International Trade Development 109 Cordell Hall 744-7693
Center for Local Government Technology 505 Engineering North 744-6049
Center for Systems Science 321 Engineering South 744-5162
Community Education Center 303 Gundersen Hall 744-7246
Electronics Laboratory 104 Electronics Lab 744-6788
Engineering Energy Laboratory 216 Engineering South 744-5157
Family Study Center 114 Home Economics West 744-5054
Fluid Power Research Center 118 Fluid Power Research Center 744-7375
Human Nutrition Center 425 Home Economics West 744-5501
Human Resources and Environmental Education Center 306 Gundersen Hall 744-7122
Oklahoma Industrial Energy Management Program 322 Engineering North 744-6055
Physical Properties Laboratory 415A Engineering North 744-5282
Plant Disease Diagnostic Laboratory 115 Life Science East 744-5643
Statistical Laboratory 301 Math Science 744-5684
University Center for Energy Research 001 Life Science East 744-5700
University Center for Water Research 001 Life Science East 744-6995
Veterinary Medical Research Program 308 Veterinary Medicine 744-6663
Veterinary Research Station 139 Agricultural Hall 744-5398
Water Quality Research Laboratory 425 Life Science West 744-5551

Accreditation

Oklahoma State University is accredited by the North Central Association of Colleges and Schools. Programs within the colleges are also accredited by other agencies.

In the College of Agriculture, the mechanized agriculture program receives approval from the American Society of Agriculture Engineers and the forestry program is accredited by the Society of American Forestry. The landscape architecture program is accredited by the American Society of Landscape Architects.

In the College of Arts and Sciences, the medical technology program is accredited by the National Accrediting Association of Clinical Laboratory Science; the chemistry program is accredited by the American Chemical Society; Health, Physical Education, and Leisure is accredited by the National Recreation and Park Association as well as the American Alliance for Health, Physical Education, Recreation and Dance; the Ph.D. program in history is accredited by the American Historical Association; the School of Journalism and Broadcasting as well as the curricula in advertising, news editorial, and public relations are accredited by the Accrediting Council on Education for Journalism and Mass Communications; the music program is accredited by the National Association of Schools of Music; and the public administration program in the Department of Political Science is accredited by the National Association of Schools of Public Administration. In the Department of Psychology, the doctoral program in clinical psychology is accredited by the American Psychological Association. The speech pathology program is accredited by the American Speech-Language-Hearing Association and the Oklahoma Speech-Hearing Association.

All programs in the College of Business Administration are fully accredited by the American Assembly of Collegiate Schools of Business, which is the only nationally-recognized accrediting body for programs in business and management. The School of Accounting has separate accreditation by this body.

In the College of Education all teacher education programs are fully accredited by the National Council for Accreditation of Teacher Education (NCATE); and the vocational rehabilitation counseling master’s program is accredited by the American Council on Vocational Rehabilitation.

In the College of Engineering, Architecture and Technology, the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology has accredited the bachelor’s programs in civil engineering, electrical engineering, industrial engineering and management, mechanical and aerospace engineering, agricultural engineering, chemical engineering, general engineering and architectural engineering. The Technology Accreditation Commission of the Accreditation Board for Engineering and Technology has accredited the bachelor’s programs in electronics technology, fire protection and safety technology, mechanical power technology, petroleum technology, construction management technology, manufacturing technology, and mechanical design technology. The National Architecture Accrediting Board has accredited both the bachelor and master’s programs in architecture.

The College of Home Economics has full accreditation for all its programs from the Council for Professional Development, American Home Economics Association. In addition, the College’s
program of home economics education and community services is accredited by the National Council for Accreditation of Teacher Education, the Oklahoma State Department of Education, and the Oklahoma State Department of Vocational-Technical Education. The Foundation of Interior Design Education Research has accredited the undergraduate interior design program. Also, the National Council for Accreditation of Teacher Education and the Oklahoma State Department of Education has accredited the programs in family relations and child development. The Child Development Laboratory has received accreditation by the National Academy of Early Childhood Programs. The Council on Accreditation of the American Dietetic Association has accredited the administrative dietetic internship program at the graduate level.

The College of Veterinary Medicine is fully accredited by the American Veterinary Medical Association. The Oklahoma Animal Disease Diagnostic Laboratory is accredited by the American Association of Veterinary Laboratory Diagnosticians and the Boren Veterinary Medical Teaching Hospital has been accredited by the American Animal Hospital Association.

Services at OSU

Library

The Oklahoma State University Edmond Low Library contains over 1,450,000 volumes, 2,100,000 microform units and over 160,000 maps. The open-stack arrangement of books and periodicals and the computer-assisted literature search and retrieval system support the on-going academic and research programs. The library contains a complete set of U.S. patents and is a regional depository of the federal government. Graduate students are entitled to a 30 day checkout period for books, and can utilize the interlibrary loan facilities.

Computer Center

The University Computer Center (UCC) provides computing services to all areas of the University including research, instruction, extension and administration. The Center operates three host computers: an IBM 3081 K with an MVS/XA operating system, a DEC VAX 11/780 with VMS, and DEC VAX 8350 using ULTRIX. These computers are accessible via a number of public terminal clusters which are connected to the Asynchronous Communications Network. This network also allows access using microcomputers on or off campus. A large number of computers maintained by various academic departments are also accessible using this network.

The UCC offers a number of computer-related services to the University community. Non-credit short courses are offered each semester. Topics include various mainframe and microcomputer subjects. Registration is required. There is a small charge for some microcomputer courses. Mainframe and microcomputer diagnostic services staff will provide quick answers to computer-related questions.

The Computer Center offers discounts on computer purchases, provides consultation for software and hardware, and has a computer demonstration lab in which the latest products can be observed.

Programming service, systems analysis, design and development are also available. There is a charge for these services.

UCC is part of the BITNET network. Users should contact the UCC to get a BITNET number.

For more information, contact the University Computer Center, located in Math Sciences 113.

Living Accommodations

From high-rise residence halls to single-dwelling apartments, OSU has housing in all types to meet many preferences. The IBA Graduate House is the residence hall designated for single graduate students. This five story air-conditioned building offers single and double year-round occupancy. There is an optional meal plan available in neighboring cafeterias. Vending machines and microwave ovens are conveniently placed in the all for limited food preparation. Other amenities include an open visitation policy, extensive study space with computer terminals and printers, and parking adjacent to the hall.

Family housing is available on a limited basis. The apartment complex features two-bedroom units. To be eligible, one spouse must be a full-time student (nine credit hours per semester) or be enrolled in six credit hours and be employed by the University 50% of the time.

To apply for either housing service, an application and deposit must be filed with the appropriate office. Thus, early application is important. For further information, contact Single Student Housing or University Apartments.

Health Care

Every student enrolled at OSU is eligible for health care at the University Health Center. Four agencies serve the University community to provide a wide range of mental health services. Low-cost life and health insurance is also available.

Recreation

Intellectual exercising involves complete development of the mind, body, and spirit, and Oklahoma State University offers a complete array of Big Eight athletic competition. The campus provides many opportunities for students to use their free time. Programs include concerts, lectures, films, and other media forms. Many student organizations function to enhance the educational experience of the student. The Colvin Physical Education Center offers a wide variety of organized and informal recreational activities including intramural sports of many types.

The Student Union offers a host of programs and services. The facilities include a complete food service, a theater, hotel, game rooms, lounges and meeting rooms, bookstores, diverse specialty shops, banking facilities and a travel agency.

Special Services

The Special Services program, a program of the University Counseling Center, provides assistance to the students enrolled in Oklahoma State University who are unique because of their social, economic, cultural or academic background. The program is designed to coordinate and provide services which will assist students so that they may reach their full potential.

Graduate Student Council

The goal of the Graduate Student Council is to improve all aspects of graduate education and graduate student life at OSU. The Council is composed of representatives from each department offering a graduate degree program. Members are nominated by the department heads with membership conferred by the dean of the Graduate College. Each representative is appointed for a term of one year providing the student is in good academic standing and is enrolled in at least two credit hours.

Financial Aid

Teaching and Research Assistantships

The University awards numerous teaching and research assistantships with competitive stipends. Fellowship opportunities are available through several programs. The terms of appointment are one semester or longer. Service expected and the number of hours of graduate work a student may take are governed by the terms of the appointment. Applications should be addressed to the head of the department in which the appointment is desired.

Oklahoma Tuition Waiver Scholarships

Eligibility: Oklahoma resident; regular admission to a graduate degree program; cumulative grade-point average greater than 3.00.

Application: Successful completion of ACT Family Financial Statement annually (packet available in Office of Financial Aids, 110 Hanner Hall); apply directly to academic departments.

Award: Varies; awards granted by semester.

Deadline: Contact department for deadline.

OSU Foundation Graduate Fellowships

Eligibility: Grade-point average greater than 3.50; acceptance into a graduate degree program; no prior work completed on the particular degree being sought.

Application: Nominations are made by the student’s department head.

Award: Variable.

Deadline: Variable.
Special Programs

Certification Programs
Oklahoma State University offers State Department of Education-approved post-bachelor's certification programs for school counselors, psychometrists, reading specialists, and library media specialists. Certification is also offered in speech and language pathology and audiology and in special education (emotionally disturbed and learning disabilities).

Master's degrees are available in most of these programs and doctorates are available in many.

Post-master's level certification programs are available in: elementary school principal; school superintendent; secondary school principal; school psychologist; and school counselor.

Inquiries concerning any aspect of the Teacher Education program should be addressed to the Office of Teacher Education or the head of the department offering the program.

Off-Campus Programs

University Center at Tulsa

Oklahoma State University offers graduate courses at the University Center at Tulsa (UCT). All courses offered by OSU faculty are considered resident credit for degrees granted by Oklahoma State University. Courses offered by the other universities participating in UCT can be applied to OSU degree requirements as transfer credit.

The graduate and certification programs approved by the Oklahoma State Regents for Higher Education for Oklahoma State University to offer through the University Center at Tulsa are:

M.S. in Computing and Information Science
M.S. in Health, Physical Education, and Recreation
M.S. in Applied Behavioral Studies
Emotionally Disturbed Learning Disabilities
Community Counseling
Certification Program in School Psychology
M.S. in Curriculum and Instruction
Elementary Education
Curriculum and Supervision
Reading Specialist
Instructional Technology
M.S. in Higher Education
Certification Program in Educational Administration (Emphasis on Standard Certification for School Superintendent)
M.S. in Occupational and Adult Education (Emphasis in Human Resource Development or Adult and Continuing Education)
M.S. in Trade and Industrial Education
M.S. in Chemical Engineering
M.S. in Electrical Engineering
M.S. in Industrial Engineering and Management
M.S. in Mechanical Engineering
M.S. in Home Economics
Family Relations and Child Development
Home Economics Education and Community Services
Housing, Interior Design, and Consumer Studies (Consumer Design)

*Approved but not currently offered.

Graduate Centers

Students make take one-half of their requirements for the master’s degree at a Graduate Center provided they comply with the following conditions:
1. Each student working for a degree must comply with requirements for admission given in the Catalog.
2. At least 22 semester credit hours must be completed after the degree plan has been approved by the student’s advisory committee and the dean of the Graduate College, and filed in the Graduate College. A minimum of 16 semester credit hours must be taken in residence on the Stillwater campus.
3. The thesis or report must be supervised and approved by resident members of the faculty teaching on the Stillwater campus.
4. Final examinations covering the entire graduate program are to be given by a committee selected by the major department and the dean of the Graduate College.
5. The last eight semester credit hours for the degree must be taken on the Stillwater campus unless a written request by the student to take the work at some other place is approved by the head of the major department and the dean of the Graduate College.

Off-campus Program in Engineering

A master’s degree in engineering may be obtained with all course requirements being met at off-campus centers of Oklahoma State University, the University of Tulsa, and the University of Oklahoma. At least one-half of the hours needed must consist of courses taught by Graduate Faculty members of Oklahoma State University. The remainder of the hours may be made up of transfer credits from the University of Oklahoma earned on campus or at its off-campus centers and/or the University of Tulsa, and a maximum of eight hours of transfer credits from other institutions with approved graduate programs. All other requirements of the regular master’s degree, as outlined in the Catalog, must be met.

Such a master’s degree has the same designations as the one earned on-campus, except that the transcript will show the wording “Off-Campus.”

Extension Credit

Any student registering in a graduate course to be taken by extension must make application for admission to the Graduate College.

Correspondence Credit

Oklahoma State University does not offer graduate courses by correspondence and does not accept credit taken by correspondence toward an advanced degree.

Mid-America State Universities Association (MASUA) Traveling Scholar Program

This program is designed to provide breadth and depth in opportunities for graduate study offered at MASUA universities by permitting advanced graduate students to apply at another MASUA university for one full term where they may utilize unique facilities or specializations.

To obtain more information about this program, interested students should contact the Graduate College.
Interdisciplinary Programs

Environmental Science
Program Coordinator John D. Vitek, Ph.D.

The environmental science program at Oklahoma State University emphasizes that an understanding of, and solution to, many environmental problems involves the application of skills and knowledge of more than one of the traditional disciplines. Graduate Faculty members from the agricultural, biological, social, and physical sciences and from engineering and education join for the purpose of offering graduate programs at both the master's and doctor's levels.

The University has had nine decades of experience and development in the application of scientific knowledge to society's problems. Important resources for graduate students are campus research and learning institutes and laboratories, cooperative programs with public and private agencies, and off-campus research and teaching facilities. Many of these are staffed by personnel drawn from more than one discipline, and many serve to address problems which are multidisciplinary or interdisciplinary in scope and solution.

The environmental science degree programs at the University are designed to utilize these resources and serve students whose interests transcend the traditional demarcations of knowledge and whose goals include the broad understandings and skills obtained by crossing disciplinary lines in the classroom and laboratory.

Graduates from the environmental science program are expected to have skills and knowledge that are applicable to a wide range of research, management, and planning vocations. Government, industry, and private consulting firms offer employment opportunities for environmental science graduates.

Programs of Study. The breadth of offerings at Oklahoma State University affords flexibility to the student interested in any aspect of the environment. In some cases, the student may choose to integrate work from another discipline with work in a discipline for which all degree requirements are met. In other cases, the student may select course work and research supervision from several disciplines in order to focus on an environmental problem or subject not normally addressed by a single discipline.

The Master of Science Degree. To obtain the M.S. degree in environmental science, a student must complete the following 36-hour program: 10 hours of core courses, a three-hour seminar in environmental problem analysis, a minimum of 17 hours of courses in a thrust area, and a six-hour thesis. The thesis must deal with an environmental problem. Four thrust areas have been identified: energy, environmental education, renewable natural resources, and water. Students must write a dissertation dealing with an environmental problem. A maximum of 24 credit hours can be earned for the dissertation. (Minimum credit allowed is 15 credit hours.) Specific requirements for the doctoral degree can be obtained from the program coordinator.

The M.S. with Environmental Science Emphasis. To obtain the M.S. degree with an environmental science emphasis, the student must satisfy minimum degree requirements as specified by one of the cooperating departments (see list below). In addition, the student will be required to take ENVIR 5103 and two courses outside the major department which provide breadth to the degree program.

The Ph. D. with Environmental Science Emphasis. To obtain a Ph.D. degree with an environmental science emphasis, the student must satisfy minimum degree requirements as specified by one of the cooperative Ph.D.-granting departments (see list below). In addition, the student will be required to take ENVIR 5103, a seminar in environmental problem analysis, and two additional courses outside the major department which provide breadth to the degree program.

Admission. A student wishing to participate in environmental science programs at OSU must apply to the Graduate College for admission. Application for the environmental science master's or doctoral degree must include a statement of educational and vocational goals and three letters of recommendation. International students must score 575 or above on the TOEFL.

Anyone interested in the environmental science emphasis should apply directly to the department in which they wish to earn a degree. The emphasis is completed by satisfying departmental and program requirements.

All applications to environmental science programs should be submitted at least 60 days before the opening of the semester for which enrollment is first intended. International students should supply all application materials by March 1st for fall enrollment, and July 1st for spring enrollment. The Graduate College will provide the necessary forms.

Financial Assistance. Fee-waiver scholarships are available through the Graduate College for environmental science students. Such scholarships are available for those who can qualify as Oklahoma residents. Priority is given to minority students, and those who can demonstrate financial need. To be considered, an ACT Family Financial Statement must be completed.

A great demand for personnel with advanced training in the broad area of food science to staff research and quality assurance facilities of industry, universities and the federal government.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree programs requires an undergraduate major in animal science, dairy science, poultry science, food science, biochemistry, microbiology or human nutrition. Students majoring in other curricula may qualify by removing specific undergraduate deficiencies recognized by the student's graduate committee. A student enrolling in a degree program must have been accepted by an adviser prior to official admission.

Natural Science
This program leading to the M.S. degree is for science teachers and other individuals who desire a broader program than that offered in department programs. The goal of the program is to provide the student with a breadth of training in science and related areas, while concentrating on one area of science. The program is administered by the dean of the Graduate College. Requests for additional information about the program should be directed to the Graduate College.

Manufacturing Systems Engineering
This interdisciplinary master's degree is designed to address the needs of manufacturing managers, particularly those in small- to medium-size firms, in all aspects of manufacturing systems,
including management as well as the hardware aspects of manufacturing.

This program, jointly sponsored by the Schools of Electrical and Computer Engineering, Industrial Engineering and Management, and Mechanical and Aerospace Engineering, produces graduates capable of direct contributions in the design, selection, and implementation of up-to-date computerized manufacturing systems.

Students wishing to pursue this degree enroll in one of the three schools listed above and are advised by a faculty member in that department. The student’s advisory committee is composed of members from each of the three schools. Students desiring more information should contact the program coordinator in the School of Industrial Engineering.

### Graduate Admission Requirements

Requirements are subject to departmental revision.

<table>
<thead>
<tr>
<th>Department/Major</th>
<th>Degree</th>
<th>GRE Gen</th>
<th>GRE Sub</th>
<th>GMAT</th>
<th>Miller Analogy (MAT)</th>
<th>Additional Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRICULTURE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Agricultural Education (Agricultural Economics, Agricultural Education, Agronomy, Animal Science, Entomology, Forest Resources, Horticulture &amp; Landscape Architecture, &amp; Plant Pathology)</td>
<td>MS, EdD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agronomy</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Crop Science</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Soil Science</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Animal Science</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Animal Breeding</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Animal Nutrition</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Dairy Science</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Poultry Science</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>MS, PhD</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td>American Chemical Society exams in chemistry.</td>
</tr>
<tr>
<td>Entomology</td>
<td>MS, PhD</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Forest Resources</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Horticulture</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Plant Pathology</td>
<td>MS, PhD</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>ARTS AND SCIENCES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Botany</td>
<td>MS, PhD</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>Chemistry</td>
<td>MS, PhD</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
<td>Entrance exams.</td>
</tr>
<tr>
<td>Computing and Information Science</td>
<td>MS</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>MS: 75 percentile minimum mathematical aptitude.</td>
</tr>
<tr>
<td></td>
<td>PhD</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>PhD: 75 percentile minimum mathematical aptitude; 50 percentile minimum advanced.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>MA: 3.00 GPA; BA in English or equivalent for TESL of Technical Writing.</td>
</tr>
<tr>
<td>English</td>
<td>MA, PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geography</td>
<td>MS</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>Geology</td>
<td>MS</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>Health, Physical Education and Recreation</td>
<td>MS</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>History</td>
<td>MA</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>PhD: 3.50 GPA; MA in English.</td>
</tr>
<tr>
<td>Mass Communications Mathematics</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>Microbiology</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>Natural Science</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No minimum score.</td>
</tr>
<tr>
<td>Philosophy</td>
<td>MA</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td>See department admission requirements.</td>
</tr>
<tr>
<td>Physics</td>
<td>MS, PhD</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Political Science</td>
<td>MA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department/Major</td>
<td>Degree</td>
<td>GRE Apt</td>
<td>GRE Adv</td>
<td>GMAT</td>
<td>Miller Analogy (MAT)</td>
<td>Additional Requirements</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------</td>
<td>---------</td>
<td>---------</td>
<td>------</td>
<td>----------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Psychology</td>
<td>PhD</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>No minimum score. Need departmental application &amp; 3 letters of recommendation. GRE required if GPA less than 3.00.</td>
</tr>
<tr>
<td>Sociology</td>
<td>MS, PhD</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>3.00 GPA minimum &amp; 3 letters of recommendation. (English is second language, TSE: 220 minimum; TOEFL: 550 minimum.)</td>
</tr>
<tr>
<td>Corrections</td>
<td>MS</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech</td>
<td>MS</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech Communication</td>
<td>MA</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speech and Language Pathology and Audiology</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(English is second language, TSE: 220 minimum; TOEFL: 550 minimum.)</td>
</tr>
<tr>
<td>Theater</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>No entrance exam. Aptitude: MS-1000, PhD-1150. Advanced: MS-600, PhD-650. Same as Wildlife and Fisheries Ecology.</td>
</tr>
<tr>
<td>Statistics</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>No entrance exam. GRE: 950, MAT: 47.</td>
</tr>
<tr>
<td>Wildlife and Fisheries Ecology</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Zoology</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BUSINESS ADMINISTRATION Accounting</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Administration</td>
<td>MBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business Administration emphasis in: Accounting</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDUCATION Applied Behavioral Studies</td>
<td>MS, PhD, EdD</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td>GRE: 950, MAT: 47.</td>
</tr>
<tr>
<td>Counseling and Student Personnel Curriculum and Instruction Educational Administration Higher Education Occupational and Adult Education</td>
<td>MS, EdD, EdS</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td>GRE: 950, MAT: 47.</td>
</tr>
<tr>
<td>Educational Administration Higher Education Occupational and Adult Education</td>
<td>MS, EdD, EdS</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td>MS: no entrance exam. EdS &amp; EdD:MAT or GRE.</td>
</tr>
<tr>
<td>Distributive Education</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Arts Education</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Education</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade &amp; Industrial Education</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department/Major</td>
<td>Degree</td>
<td>GRE Apt Adv</td>
<td>GMAT Miller Analogy (MAT)</td>
<td>Additional Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>-----------------</td>
<td>-------------</td>
<td>---------------------------</td>
<td>----------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGINEERING</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural Engineering</td>
<td>MAgE, MS, PhD</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture</td>
<td>MArch</td>
<td></td>
<td></td>
<td>See specific school admission requirements.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architectural Engineering</td>
<td>MArchE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>MChemE, MS, PhD</td>
<td>2</td>
<td>2</td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>MCivilE, MS, PhD</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Engineering</td>
<td>MEnvirE, MS</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>MElecE, MS, PhD</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Engineering</td>
<td>MGenE, MS, PhD</td>
<td>2</td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial Engineering and Management</td>
<td>MIE&amp;Mgmt, MS, Ph</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>MMechE, MS, PhD</td>
<td>2</td>
<td>2</td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear Engineering</td>
<td>MS</td>
<td>2</td>
<td>2</td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HOME ECONOMICS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing, Textiles and Merchandising</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Relations and Child Development</td>
<td>MS</td>
<td>1 (for FRCD</td>
<td>3</td>
<td>No entrance exam for other areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Clothing, Textiles and Merchandising;</td>
<td>(Clothing, Textiles and Merchandising; Family Relations and Child Development; Food, Nutrition, and Institution Administration; Home Economics Education and Community Services; Housing, Interior Design and Consumer Studies.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food, Nutrition and Institution</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>PhD</td>
<td>1 (for FRCD</td>
<td>3</td>
<td>No entrance exam for other areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Economics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education and Community Services</td>
<td>MS, EdD</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing, Interior Design and Consumer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>MS</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOOD SCIENCE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Science</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td>No entrance exam; 575 TOEFL.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Science</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td>No entrance exam.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing Systems Engineering</td>
<td>MMSE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Science</td>
<td>MS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VETERINARY MEDICINE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physiological Science</td>
<td>MS, PhD</td>
<td>1</td>
<td>1</td>
<td>GPA last 60 hrs. B.S. X GRE must equal 3000 or above for MS or 3150 or above for PhD.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veterinary Parasitology</td>
<td>MS, PhD</td>
<td></td>
<td></td>
<td>GPA last 60 hrs x General score on GRE must equal 3000 or above for unqualified admission.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veterinary Pathology</td>
<td>MS, PhD</td>
<td></td>
<td>1</td>
<td>No minimum score.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
General Regulations

Responsibilities

All graduate students are expected to read and to comply with the written regulations. The regulations presented in the Catalog may be supplemented by written departmental or program requirements available at departmental offices. General regulations in the following sections relate to requirements for admission, enrollment, and academic standing. Succeeding sections outline requirements for the following degrees: master’s, Doctor of Philosophy, Doctor of Education, and Specialist in Education. Particular attention should be given to timing and substantive requirements for matriculation, especially admission, the plan of study, residence, language proficiency, research and thesis or report, and graduation. The regulations are prescribed by the Graduate Faculty with the intent of assuring high-quality graduate programs and effective interaction of Graduate Faculty members and graduate students.

A request for waiver of any regulation must be made in writing to the dean of the Graduate College for presentation to the Graduate Council for action. Such a request must be approved by the major adviser. The student and the major adviser should present sufficient information to allow the Graduate Council to evaluate reasons for requesting a waiver and to make a decision concerning departure from normal Graduate College regulations.

Admission to the Graduate College

Qualified graduates of colleges and universities of recognized standing are eligible to seek admission to the Graduate College. Applicants must submit the completed application form to the Graduate College, with official transcripts of all academic work and degrees received.

1. The student should request all institutions previously attended to send two copies of the official transcript to the Graduate College, Oklahoma State University.

2. To be official, the transcript must show the complete scholastic record, bear the official seal of the institution, and be signed by the issuing officer.

To assure adequate time, application forms and transcripts should be received by the Graduate College at least 30 days prior to expected enrollment. Transcripts and other credentials become the property of the University and must remain on file in the Office of the Registrar.

Standardized Test Scores

Many departments require standardized test scores, such as the Graduate Record Examination. Applicants must contact the appropriate department head for information regarding departmental requirements for these tests. (Refer to the Table “Graduate Admission Requirements.”)

International Student Admission

International applicants are expected to submit applications, financial affidavits, transcripts, and results of the Test of English as a Foreign Language (TOEFL) examination by March 1 for fall enrollment and by July 1 for spring enrollment.

TOEFL. As a condition of admission to regular graduate study at OSU, all persons for whom English is a second language are required to present a score of 550 or above on the TOEFL regardless of the number of semesters or terms completed in other institutions of higher education, including OSU, or prior enrollment in English language programs. Some departments require a score above 550. Students should contact the department for specific TOEFL requirements. Persons who present a TOEFL score of 500 or above and who demonstrate unusual academic promise may be admitted to graduate study on probationary status, but the number of such persons will not exceed two percent of the regularly enrolled graduate student population of the previous fall semester.

Submission of the TOEFL score with the application is never waived.

English Proficiency Test for International Students. Before international students who have no prior course work from a U.S. university can complete their first enrollment at Oklahoma State University, they are required to take the Test of English Language Proficiency (TELP) administered by the University Testing and Evaluation Service. This test, scheduled on campus before each semester and summer session, is required in addition to the TOEFL. Should a student's composite score on the TELP indicate a need for further work in English, the student is required to enroll in a nongraduate-credit English course until the deficiency is removed. This enrollment is concurrent with courses enrolled in for the advanced degree.

Spoken English Proficiency for Employment. OSU policy requires all persons for whom English is a second language to demonstrate an acceptable level of spoken English before being employed as a member of the faculty, as a teaching assistant or teaching associate, or for other instructionally related assignments. Employment requires a score of 220 or above on the Test of Spoken English (TSE). This test may be taken on campus or at one of the many testing sites provided by the Educational Testing Service. This test score is used as a condition of employment, not a condition for admission to the Graduate College.

Types of Admission

Oklahoma State University uses the 4.00 scale to calculate grade-point averages; that is, an "A" yields four points per credit hour, a "B" yields three points, a "C" yields two points, a "D" yields one point, and an "F" yields zero points. If an applicant's prior college or university uses a different scale, the grade-point average must be converted to the 4.00 scale to determine whether the applicant meets Oklahoma State University grade-point admission requirements for one of the types of admission. Therefore, all references to grade-point averages are based on a 4.00 scale. References to credit hours are to semester credit hours.

When the applicant's file is complete, the faculty in the department or program of the student's area of interest is asked to review the material and recommend an admission status to the dean of the Graduate College. The final decision for admission to the Graduate College is determined by the dean on the basis of the department's recommendations, prior academic performance of the applicant, and availability of space, facilities, and faculty advisers in the program. The decision is conveyed to the applicant by means of a letter. Admission to the Graduate College means only that the student will be permitted to enroll in courses through the Graduate College. It does not necessarily imply that the student had better of Science, Doctor of Education, or Doctor of Philosophy. Not all courses used to meet requirements for a professional degree can be used to meet requirements for graduate degrees.

Unqualified Admission. Students planning to work toward a graduate degree in a recognized graduate program may be admitted without qualification provided they meet all Graduate College and departmental requirements.

1. Admission to full graduate status in a degree program is contingent on the presentation of an undergraduate degree from an accredited college or university, an acceptable academic record and the recommendation of the major department and the dean of the Graduate College.

2. If a student fails to provide proof of the receipt of an undergraduate degree or fails to remain in good standing academically, academically classified status may be changed to probationary or unclassified.

Special Student Status. An applicant may be admitted to the Graduate College as a special student if he or she does not have immediate plans to become a degree candidate but wants to take graduate courses, prerequisites or other courses. International students with an F-1 visa may not enroll as special students.

1. A special student must meet all of the academic requirements described for unqualified admission except that he or she need not be admitted or recommended for admission by a department or program.

2. The student is responsible for filing a new application for admission to the Graduate College should he or she wish to become a degree candidate. The application will be evaluated by the faculty of the department or program and the dean of the Graduate College to ascertain admissibility to the degree program.

As such work is not guided by a plan of study or approved by an adviser, no more than nine semester credit hours of course work taken while a special student may be used on a plan of study to meet requirements for a degree.

Graduate Student-Professional. Students with a bachelor's degree or equivalent level of academic attainment who wish to improve their professional competence by participating in post-baccalaureate study in a professional degree program may be admitted in the status of Graduate Student-Professional.

1. Students admitted in this status, but desiring admission to a graduate degree program, must submit a new application.

2. The student should be aware that only selected courses taken in this category, as recommended by the major adviser and approved by the Graduate College, may be used to meet requirements for advanced degrees such as the Master of Science, Doctor of Education, or Doctor of Philosophy. Not all courses used to meet requirements for a professional degree can be used to meet requirements for graduate degrees.

Unclassified Graduate Student Status. Students with bachelor's degrees from accredited colleges or universities may be admitted as
Audit
A student who does not wish to receive credit in a course may, with the approvals of the student’s adviser and the instructor of the course concerned, attend the class strictly as a visitor. A student who applies to audit a course promises that he or she will not use the audit to avoid the rule against excessive hours, and that he or she will not petition or ask in any way for the privilege of taking an examination to obtain credit after he or she has audited the course. (Laboratory courses, private music lessons and art courses are not open for audit.)
A student who has established a permanent record at OSU may have the audited course recorded on his or her transcript with the word “audit” appearing in place of the grade. Not later than one week after the close of that semester, the student must present to the Office of the Registrar the instructor’s copy of the audit form with a signed statement from the instructor, on the reverse side, that it is appropriate for the course to be recorded on the student’s transcript.
Any individual 65 years or older may obtain an audit form at no charge.

Tuition Regulations
Tuition and Fees
Refer to the section on “Costs.”

Tuition Waiver Policy for Graduate Assistants and Spouses
The University will waive the nonresident tuition for graduate assistants who are employed at least one-fourth time in instruction, research or extension.
The nonresident tuition for summer will be waived even if the student is not employed as a graduate assistant for that period if the student held an assistantship for the preceding spring semester.
A student who is employed as a graduate assistant is also eligible for a nonresident tuition waiver.

Enrollment
Students with a bachelor’s degree are expected to register in the Graduate College unless they want to obtain another bachelor’s degree. If they register as an undergraduate, the courses taken cannot be given graduate credit at a later date.
Students in the Graduate College may enroll in a course which does not carry graduate credit or audit courses if such courses are recommended by an adviser and approved by the dean of the Graduate College. Students who desire to enroll concurrently in another institution or by extension at OSU must secure approval in advance from the dean of the Graduate College. Forms are available in the Graduate College.
An advance fee payment is required of all new and readmitted students.
Students will be permitted to enroll (late fee will be charged) or to add a course through the first week of a semester or summer session. For short courses, students will not be permitted to enroll after the first day of the course.

Enrollment Procedure
1. Enrollment forms (trial schedules) are available in the Graduate College.
2. Advanced degree candidates have their trial schedule forms approved and signed by their departmental advisers and take them to the Graduate College prior to enrolling. Special and unclassified students have their trial schedule forms approved in the Graduate College prior to enrolling.
3. After having the trial schedule form approved in the Graduate College, graduate students complete the enrollment process in the Sectioning Room located on the fourth floor of the Student Union.

Phone-in Enrollment
Individuals residing outside Stillwater may wish to take advantage of the phone-in enrollment procedure. Graduate students may enroll by phone if they have been accepted into the Graduate College, are continuing students, or have taken courses at OSU since 1982. Students must have no academic or financial holds on their enrollment and must have the required $40 advance fee payment on file in the Office of the Bursar. Oklahoma residents may use the toll-free number: 1-800-522-6809; others may use the 405-624-6368.

Minimum and Maximum Hours of Enrollment
Any graduate student using the facilities and faculty resources of the University must be enrolled. Every graduate student is expected to satisfactorily complete no fewer than six semester credit hours during the academic year (fall, spring and summer) until the degree is awarded. Students may satisfy this requirement by enrolling for the required hours during any one term or by continuous enrollment during the three terms. The total registration shall not exceed 18 credit hours for a semester or nine credit hours for a summer session. Regardless of the number of hours taken, a student may not count more than 16 credit hours taken in the fall or spring semester nor more than nine semester credit hours earned in a summer session toward a degree. For short-course sessions less than eight weeks in length, enrollment shall not exceed one credit hour for each week. Students in the Graduate College who are not taking any courses for graduate credit may register for the number of credit hours recommended by their advisers and approved by the dean of the Graduate College.

Enrollment Regulations for Graduate Assistants and Fellows. Graduate students employed by the University part time may register only for the amount of credit recommended by the head of the major department and approved by the dean of the Graduate College. In general, students employed 22 hours per week may not register for more than 10 semester credit hours of course work for a semester and five hours during a summer session. Other employment will permit registration for an appropriate number of hours. Graduate students whose employment is such that results will be used for a thesis, however, may register for additional thesis credit as recommended by the research adviser and approved by the dean of the Graduate College.

Any graduate student holding an assistantship or fellowship must enroll in at least six resident semester credit hours during the fall and spring
Academic Regulations

Refer also to the sections on "Adding Courses," "Dropping Courses," and "Withdrawing from the University."

Graduate-credit Courses

Courses numbered 5000 and above are primarily for graduate students, and only graduate students and seniors who have obtained prior approval may enroll. The majority of courses on the master’s and doctoral plans of study will be 5000 level and above.

Courses numbered 3000 and 4000 that are identified by an asterisk in the "Course Listings" may be taken by graduate students. Graduate students enrolled in these courses will be considered as taking the courses for graduate credit and expected to fulfill all academic requirements as proposed by the professor.

Graduate students numbered 3000 and 4000 may be used to meet requirements for a graduate degree on the plan of study if approved by the student's advisory committee and the dean of the Graduate College. Courses that are not identified by an asterisk may not be used to fulfill requirements for a graduate degree.

Academic Standing

Minimum Grade Requirements. A grade-point average of "B" (3.00) is required to (1) maintain good standing as a graduate student and (2) meet requirements for a degree. In determining whether a student has met minimum requirements for a degree, grades for courses on the plan of study are averaged separately from other courses not on the plan of study. A student must have a "B" grade average in all courses on the plan of study; and also, a "B" grade average in thesis, report, and problem courses. After a student has completed a course, it cannot be dropped from the plan because of a low grade, unless the change in the plan of study is first approved in writing by the student’s adviser, and then by the dean of the Graduate College.

A course with a grade below "C" cannot be used as part of the minimum number of semester credit hours required for the degree.

Some departments have more stringent requirements. The major department should be consulted concerning minimum grade requirements.

Academic Warning and Strict Academic Probation. If any student in good academic standing earns a grade-point average for a semester less than 3.00, a "warning" letter is sent as a reminder that the Graduate College requires a minimum grade-point average of 3.00. The semester grade-point average is based upon total enrollment, regardless of course level or whether the courses were taken as prerequisites or for personal interest.

If the grade-point average falls below 3.00 again in the next semester, the student is placed on "strict academic probation." On "strict academic probation," a minimum grade of "B" must be earned in every class. Failure to earn a "B" in each class results in dismissal from the University.

Students are notified by letter each semester in which grades indicate a lack of satisfactory progress toward a degree.

Grades for Thesis (5000) and Dissertation (6000). The grade of "R," indicating research progress, may be assigned to thesis (5000) and dissertation (6000) courses until the research is finished. Advisers also have the option of assigning a letter grade each semester. By assigning the grade of "R," the adviser acknowledges that the student has made progress on thesis or dissertation research. Upon completion of the thesis or dissertation, the adviser submits a Change of Grade form to have the final grade entered for the thesis or dissertation.

Pass-no Pass Grading System. The "P" or "NP" grade refers only to the final grade in the course as recorded by the Office of the Registrar. Homework will be assigned and evaluated, and tests and examinations will be given. Students taking the course on a "P" or "NP" basis are expected to satisfy these course requirements. "P" indicates a grade equivalent to an "A," "B," or "C" while "NP" indicates a grade equivalent to "D," "F," or "WF."

Graduate students may take a course utilizing the "Pass-No Pass" grading system with the consent of their major adviser and the dean of the Graduate College, but courses taken under this system cannot be used on a plan of study to meet graduate degree requirements unless the following requirements are met.

A graduate student wishing to use a course taken on a "Pass-No Pass" basis on his or her plan of study to meet degree requirements must submit a letter along with the Trial Schedule form at the time of enrollment to the major adviser. The major adviser will consider the request and if approved, the letter and Trial Schedule form will be submitted to the dean of the Graduate College for approval. A student who chooses the Pass-no Pass grading system may change to the usual grading system with the consent of his or her major adviser and the dean of the Graduate College anytime prior to the second week of classes for a semester or summer session. Once the deadline has passed, a student will not be permitted to change his or her choice of grading system.

Grade Appeals. A student may appeal a grade given by an instructor in a case in which he or she believes the grade awarded is inconsistent with announced grading policy. The student should consult the Student Rights and Responsibilities pamphlet or contact the Office of the Vice-President for Academic Affairs and Research for information regarding initiating the appeals process.

Application for Diploma-Graduation

At the time of enrollment for the last semester or summer session of work toward a degree, the student completes an Application for Diploma and a completion of that card initiates clearance procedure toward graduation by the Graduate College and the Office of the Registrar. The student is billed for the graduation fee along with tuition.

If all requirements for the degree are met according to deadlines specified in the Graduate College Calendar, the student must complete a new Application for Diploma at the time of re-enrollment. Applications for degrees will not be accepted after the first two weeks of a regular semester or the first week of a summer session.

Full-time or Half-time Status. Full-time or half-time status of graduate students is:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Full-time</th>
<th>Half-time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular Semester</td>
<td>9 or more hrs.</td>
<td>4-8 hrs.</td>
</tr>
<tr>
<td>Summer Session</td>
<td>4 or more hrs.</td>
<td>2-3 hrs.</td>
</tr>
</tbody>
</table>

The Office of the Registrar considers employment as a teaching or research assistant when determining enrollment status. A student holding a 0.50 FTE graduate assistant appointment, and enrolled in a minimum of six hours during the Fall or Spring semester, and three hours during the summer semester will be certified as a full-time graduate student.

Enrollment During the Research Phase

Because enrollment reflects the involvement of University faculty members, the graduate student must maintain continuous enrollment throughout the research phase of the program. Such enrollment is not limited by the maximum number of credit hours per week which may apply toward a degree.

All students who plan to complete the requirements for a degree must be enrolled in not fewer than two hours of thesis credit (or course work credit for master's candidates only) for the semester or summer session in which the examination is scheduled, or other requirements are met.
Records and Transcripts
All permanent records are stored in the Office of the Registrar in Whitehurst Hall. Requests for grades, transcripts and diplomas should be made to that Office.

A graduate student who does not complete the requirements in time to receive the degree at the end of the summer semester may secure a statement from the Office of the Registrar when all requirements for the degree have been satisfied. Such a statement will not be issued until all grades for the semester have been recorded.

Master's Degree Programs
Accounting, MS
Agricultural Economics, MS
Agricultural Education, MS
Agricultural Engineering, MAgE, MS
Agriculture, MAg (Agricultural Economics, Agricultural Education, Agronomy, Animal Science, Entomology, Forest Resources, Horticulture and Landscape Architecture, and Plant Pathology)
Agronomy, MS
Animal Science, MS
Applied Behavioral Studies, MS
Applied Mathematics, MS
Architectural Engineering, MArchE
Architecture, MA
Biochemistry, MS
Botany, MS
Business Administration, MBA
Chemical Engineering, MChemE, MS
Chemistry, MS
Civil Engineering, MCivilE, MS
Clothing, Textiles and Merchandising, MS
Computing and Information Science, MS
Corrections, MS
Counseling and Student Personnel, MS
Curriculum and Instruction, MS
Dairy Science, MS
Distributive Education, MS
Economics, MS
Educational Administration, MS
Electrical Engineering, MElecE, MS
English, MA
Entomology, MS
Environmental Engineering, MEnviE, MS
Environmental Science, MS
Family Relations and Child Development, MS
Food, Nutrition and Institution Administration, MS
Food Science, MS
Forest Resources, MS
General Engineering, MGenE, MS
Geography, MS
Geology, MS
Health, Physical Education and Recreation, MS
Higher Education, MS
History, MA
Home Economics Education and Community Services, MS
Horticulture, MS
Housing, Interior Design, and Consumer Studies, MS
Industrial Arts Education, MS
Industrial Engineering and Management, MIE&Mgmt, MS
Manufacturing Systems Engineering, MMSE
Mass Communications, MS
Mathematics, MS
Mechanical Engineering, MMechE, MS
Microbiology, MS
Natural Science, MS
Nuclear Engineering, MS
Occupational and Adult Education, MS
Philosophy, MA
Physics, MS
Physiological Science, MS
Plant Pathology, MS
Political Science, MA
Poultry Science, MS
Psychology, MS
Sociology, MS
Speech, MA (Speech Communication; Speech and Language Pathology and Audiology; Theater)
Statistics, MS
Technical Education, MS
Trade and Industrial Education, MS
Veterinary Parasitology, MS
Veterinary Pathology, MS
Wildlife and Fisheries Ecology, MS
Zoology, MS

Abbreviations:
MA Master of Arts
MAgE Master of Agricultural Engineering
Mag Master of Agriculture
MArch Master of Architecture
MArchE Master of Architectural Engineering
MBA Master of Business Administration
MChemE Master of Chemical Engineering
MCivilE Master of Civil Engineering
MElecE Master of Electrical Engineering
MEnviE Master of Environmental Engineering
MGenE Master of General Engineering
MIE&Mgmt Master of Industrial Engineering & Management
MMSE Master of Manufacturing Systems Engineering
MMechE Master of Mechanical Engineering
MS Master of Science

Admission to a Program. Some departments require that any student seeking a master's degree take an examination (e.g. GRE, GMAT) before being admitted to a program of study. See table on "Graduate Admission Requirements" or contact the head of the major department.

Basic Requirements. The master's degree may be earned by one of three plans:

Plan I-with thesis, 30 credit hours, including six credit hours for the thesis;
Plan II-with report, 32 credit hours, including two credit hours for the report;
Plan III-with no thesis or report, 32 credit hours of course work including the creative component. The Plan III program must contain a creative component which is explicitly identified on the plan of study. For example, the creative element may be a special report, an annotated bibliography, a project in research or design, or other creative activity.

The number of credits specified for each plan are minimums set by the Graduate College. Departmental requirements may exceed these. The major department, with the approval of the dean of the Graduate College, decides which alternatives are open to the candidates. Some departments also require a minimum number of semester credit hours of upper-division and graduate courses in the major field, including courses taken as an undergraduate.

Residence Requirements. Candidates for a master's degree must complete a minimum of 21 semester credit hours in residence if they follow Plan I, or 23 semester credit hours if they follow Plan II or III. The exception is that with the written recommendation of the head of the major department, the dean of the Graduate College may authorize the thesis or report to be prepared in absentia and the credit counted toward meeting the residence requirement. When this option is utilized, the student must register at the beginning of the fall semester and conduct the study or research under the guidance of a member of the graduate faculty of the appropriate department.

Students taking courses at Graduate Centers may decrease the residence requirements to 16 semester credit hours if they have study plans approved in advance by the major department and the dean of the Graduate College.

Nine semester credit hours of the 30 or 32 required for the degree may be completed: (1) by residence courses taken at an accredited college or university, (2) by extension or in-service courses from Oklahoma State University or from another accredited institution, or (3) by a combination of these methods. Students may petition the dean for exceptions and deviations. Courses taken in Stillwater through the OSU extension program are not considered as residence credit.

The last eight semester credit hours for the degree must be taken on the Stillwater campus unless a written request by the student to take the work at another location is approved by the head of the major department and the dean of the Graduate College.

Advisement. The student should go to the department head, who may assign an adviser or advisory committee to assist the student in planning and pursuing the entire program for a degree. The advisory committee must include a minimum of three members of the Graduate Faculty.

Level of Courses Applied to Graduate Degree. Graduate students must enroll in no fewer than 21 semester credit hours of 5000- and 6000-level courses through Oklahoma State University as presented on the plan of study to meet requirements for the master's degree.

Plan of Study. The preliminary plan of study for the degree must be filed in the Graduate College prior to enrollment for the 17th graduate credit hour for students working for a master's degree in residence, or prior to enrollment for the ninth graduate credit hour for students pursuing graduate study at Graduate Centers. The student should secure the plan of study forms from the Graduate College, develop the plan with the adviser, and file three copies in the Graduate College. All copies must be signed by the adviser and two other members of the graduate faculty in the major department, and approved by the dean of the Graduate College.

A student majoring in a master's degree in Teacher Education must be admitted to the master's curriculum in Teacher Education before submitting a plan of study.

The plan of study is subject to modification as the student progresses, but all changes must have the approval of the adviser. A final, accurate plan of study must be filed in the Graduate College by the end of the second week of the semester or session in which the degree is to be conferred.

Graduate credit used to obtain one master's degree cannot be counted toward another master's degree.

Major Subject or Field. A major field of study may cross departmental lines subject to the decision of the major department. Graduate students must enroll in no fewer than 21 semester credit hours of 5000- and 6000-level courses through the department of the student's major.
**Summary of Procedure for Master's Degree**

**Dean-Dean of Graduate College**  
**GCO-Graduate College Office**  
**DH-Department Head**  
**TA-Temporary Adviser**  
**Adviser-Person designated by department head to advise**  
**Comm-Committee**

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Initiate through</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply for admission. (Follow instruction sheet carefully. If relevant, see &quot;Requirements for Admission to Teacher Education&quot; in the &quot;College of Education.&quot;)</td>
<td>Dean</td>
<td>Complete 30 days prior to enrollment. (60 days prior for international students.)</td>
</tr>
<tr>
<td>2. Read &quot;General Regulations&quot; and &quot;Master's Degree&quot; sections, then secure registration materials in the Graduate College.</td>
<td>GCO</td>
<td></td>
</tr>
<tr>
<td>3. Secure assignment of a temporary adviser from department head of major department and enroll for the first semester.</td>
<td>DH &amp; TA Dean</td>
<td></td>
</tr>
<tr>
<td>4. Plan program with advice of department head or designated Graduate Faculty member and submit plan of study.</td>
<td>Adviser Dean</td>
<td>Prior to enrolling for the 17th credit hour for extension students.</td>
</tr>
<tr>
<td>5. Proceed with course work and research assignment.</td>
<td>Adviser</td>
<td></td>
</tr>
<tr>
<td>6. Complete the Application for Diploma card at the time of enrollment; make any corrections needed on plan of study.</td>
<td>GCO</td>
<td>At the time of enrollment for the semester or term in which the degree is to be conferred. (Application good for stated degree date only. File new application if conferring of degree is delayed.)</td>
</tr>
<tr>
<td>7. Take comprehensive written examinations as required by major department.</td>
<td>Adviser</td>
<td></td>
</tr>
<tr>
<td>8. Complete research, prepare final draft copy of thesis or report and submit it at least one week prior to the final examination, along with a copy of the abstract, to each member of the examining committee and to the Graduate College. The final draft must be complete and legible. Ordinary proofreading marks and minor handwritten additions, changes, etc. are permitted, but the copy should be in such condition that it can be read easily and understood clearly. The format must follow the Graduate College Style Manual recommendations, unless a waiver is requested by the adviser. Any requests for waivers should be submitted along with the thesis or report final draft copy. The thesis title must be correct and cannot be changed since it will appear in the Commencement Program. The adviser's signature must be on the copy submitted to the Graduate College.</td>
<td>Dean Adviser</td>
<td>Deadlines published yearly.</td>
</tr>
</tbody>
</table>

---

**Minor Subject or Field.** To minor in a subject or field, a student must complete, as a minimum, enough semester credit hours as a graduate student to satisfy, with undergraduate credits, the requirements for an undergraduate major in that department. The minor may vary from six to 15 semester credit hours.

A student may minor in two departments if the requirements are met for each and the major and department and both minor departments approve.

**Language Requirements.** A candidate for the master's degree may be required to demonstrate a reading knowledge of a modern foreign language. Any such requirement of the department is included on the plan of study and is to be filled out at the time the preliminary plan is approved by the student's adviser.

If a foreign language is required, the head of the major department must certify that it has been met before a final examination can be scheduled.

A foreign language requirement for a master's degree may be met either by examination or by college credit, according to individual department requirements.

**Written Examinations.** Some departments require a written examination covering the major and minor fields. It is usually taken before the thesis or report has been completed. Arrangements for taking the examination should be made with the department at least three weeks in advance. The written examination must be passed before a final examination is scheduled.

A student who fails all or part of the written examination should consult the chairman of the examination committee to find out what must be done before taking another examination.

A student does not complete requirements for the master's degree within two years after passing the written examination, a new plan of study must be submitted and another written examination passed.

**Thesis or Report.** Any student working on a thesis or report should purchase a copy of the *Graduate College Style Manual*, published by and available from the Graduate College. A thesis or report must conform to the specifications set forth in this manual. Variations may be made from the specifications only if requested by the head of the department and approved by the dean of the Graduate College.

After completing the research, the student prepares a final draft copy (complete and legible final draft) of the proposed thesis or report, and submits a copy, along with the abstract, to each member of the examining committee, and to the Graduate College. When the final draft copy is submitted, the title must be final, and any request for waiver of the *Graduate College Style Manual* recommendations must be made. The proof copy...
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>Candidate makes changes in thesis or report as required by examining committee and by the Graduate College. The committee will notify the Graduate College immediately of results of the final examination on Form T-2. Following satisfactory completion of the final examination, the candidate will make changes in the thesis or report as required by the committee and by the Graduate College, and submit it in final form signed by the committee to the Graduate College.</td>
</tr>
<tr>
<td>10.</td>
<td>Committee chairman notifies Graduate College of the examination results immediately following conclusion of the examination (Form T-2).</td>
</tr>
<tr>
<td>11.</td>
<td>Candidate makes changes in thesis or report as required by examining committee and by the Graduate College. Advisory committee members sign final copies of thesis or report. The student must submit to the Graduate College three copies of the thesis with six copies of the abstract no later than the stated deadline (see &quot;Graduate College Calendar&quot;). These final copies of the thesis are accompanied by Form T-3. The thesis copies become the property of the University. Two copies are filed in the Library and one copy is kept by the major department. There is a binding fee, payable at the Office of the Bursar. Form to be obtained from the Graduate College after the thesis has been formally accepted by that office.</td>
</tr>
<tr>
<td>12.</td>
<td>Pay binding fee in the Bursar's Office and return form to the Graduate College.</td>
</tr>
<tr>
<td>13.</td>
<td>Arrange for cap, gown and hood at Student Union Bookstore and attend Commencement.</td>
</tr>
</tbody>
</table>

---

**Oklahoma State University**

must be signed by the adviser and be submitted to the Graduate College no later than the stated deadline date (see "Graduate College Calendar").

Permission to administer the final examination is requested from the dean of the Graduate College on Form T-1 which must contain the signature of each member of the examining committee, indicating that each has received the thesis or report and concurs in the request to administer the final examination. The adviser uses Form T-1 to propose a specific time and place for the examination.

The final examination is primarily a defense of the thesis or report. If the defense is judged inadequate, a decision on whether to permit re-examination will be made by the examining committee. Examinations are open to all members of the Graduate Faculty, and may be attended by anyone else who obtains the permission of the committee.

The committee will notify the Graduate College immediately of results of the final examination on Form T-2. Following satisfactory completion of the final examination, the candidate will make changes in the thesis or report as required by the committee and by the Graduate College, and submit it in final form signed by the committee to the Graduate College.

**Thesis.** The student must submit to the Graduate College three copies of the thesis with six copies of the abstract no later than the stated deadline (see "Graduate College Calendar"). These final copies of the thesis are accompanied by Form T-3. The thesis copies become the property of the University. Two copies are filed in the Library and one copy is kept by the major department. There is a binding fee, payable at the Office of the Bursar. Form to be obtained from the Graduate College after the thesis has been formally accepted by that office. |

**Final Examination.** If the thesis or report option is used, the dean of the Graduate College arranges with the major department for the final examination after the draft copy of the thesis or report has been filed in the Graduate College and distributed as described in the preceding section. The final examination may be oral or written or both.

A student who fails to pass either a written or oral final examination should consult the chairman of the examining committee. Another examination cannot be given for two months after a failure, and a department may limit the number of times that the examination may be repeated.

If the non-thesis option is used, the department head or adviser must notify the dean of the Graduate College that the student has satisfactorily completed all departmental requirements. If the department requires a final oral and/or written examination, forms for arranging the examination can be obtained from the Graduate College. Both positive and negative results must be reported to the Graduate College.

**Time Limit.** Students are expected to complete the requirements for the master's degree within four years after filing the plan of study (i.e., the semester in which the 17th hour of the program was completed).
To determine whether or not courses taken more than four years before the anticipated date of the degree can be counted toward the degree, the student should consult the departmental graduate adviser. Such courses cannot be accepted except on a complete plan of study which gives the date that the requirements for the degree are to be completed. They must be a part of a study plan and can be approved only for a specified time.

Continuous Enrollment. A graduate student must maintain continuous enrollment during the entire research phase of the program. Such enrollment is not limited by the maximum number of credit hours of thesis which may apply to the degree. Continuous enrollment can be met with six credit hours per year or two credit hours in each of the fall, spring and summer semesters.

Special Requirements for Selected Master's Degrees. Requirements for the Master of Agriculture, Master of Architecture, Master of Architectural Engineering, Master of Business Administration, and Master of Engineering are described in detail elsewhere in the Catalog. Each degree has requirements that are program specific and exceed the minimal requirements specified by the Graduate College.

Doctor of Philosophy Degree Programs (Ph.D.)

Agricultural Economics  
Agricultural Engineering  
Animal Breeding  
Animal Nutrition  
Applied Behavioral Studies  
Biochemistry  
Botany  
Business Administration  
Chemical Engineering  
Chemistry  
Civil Engineering  
Computing and Information Science  
Crop Science (Horticulture and Landscape Architecture)  
Economics  
Electrical Engineering  
English  
Entomology  
Environmental Science  
Food Science  
General Engineering  
History  
Home Economics (Clothing, Textiles and Merchandising; Family Relations and Child Development; Food Nutrition, and Institution Administration; Housing, Interior Design and Consumer Studies)  
Industrial Engineering and Management  
Mathematics  
Mechanical Engineering  
Microbiology  
Physics  
Physiological Science  
Plant Pathology  
Psychology  
Sociology  
Soil Science  
Statistics  
Veterinary Parasitology  
Veterinary Pathology  
Wildlife and Fisheries Ecology  
Zoology

The Doctor of Philosophy degree is granted in recognition of high achievement in scholarship and independent investigation. The candidate must prove his or her acceptability by (1) successfully completing a series of courses comprising a plan of study, (2) passing various examinations demonstrating academic competence; (3) carrying out a research program under supervision and preparing an acceptable dissertation, and (4) demonstrating initiative, creative intelligence, and ability to plan and carry out research in his or her chosen field.

Basic Requirements. The Doctor of Philosophy degree requires six semesters of full-time graduate study (a minimum of 90 semester credit hours) beyond the bachelor's degree, or four semesters of full-time graduate study (a minimum of 60 semester credit hours) beyond the master's degree. This includes a minimum of 15 credits for the dissertation (6000). Students may use 90 hours beyond the bachelor's degree as a degree total only if admitted directly into the doctoral program from the bachelor's degree.

Admission to a Program. A student who wishes to earn a Doctor of Philosophy degree may be required to take examinations based on a year of graduate study, or to produce other evidence of scholarly achievement consistent with expected academic competence in a field of specialization. Contact the head of the major department for the requirements for admission to the doctoral program.

The instructions for admission, registration, and other information given under "General Regulations" are also applicable to those who are working toward doctoral degrees.

Notice of Intention. Before taking additional courses after completing the requirements for a master's degree, a student who expects to work toward the Doctor of Philosophy degree should file a Notice of Intent form to become a candidate for the degree. The Notice of Intention form must be approved by the Graduate College office and is filed in that office.

The Notice of Intention must be filed prior to midsemester of the first semester of graduate enrollment beyond the master's degree or prior to the second summer of enrollment for those who enroll only during summer sessions. Unless the form is submitted to the Graduate College, the courses taken may possibly not be accepted for the degree.

Temporary Adviser. Upon receiving the Notice of Intention of a student to become a candidate for the Ph.D. degree, the dean of the Graduate College will designate a member of the Graduate Faculty to serve as temporary adviser to the student. The temporary adviser will arrange the collection of information about the student and assist him or her in the early selection of courses.

Advisory Committee. Upon recommendation of the head of the major department or of the graduate committee of the department, an advisory committee of not fewer than four members will be appointed by the dean of the Graduate College. The duties of the advisory committee consist of (1) advising the student, (2) assisting the student in preparing a plan of study, (3) preparing and administering the qualifying examination, (4) assisting in planning and conducting the research, (5) supervising the writing of and passing upon the thesis, and (6) conducting the final examination. The chairman of the advisory committee must be a member of the Graduate Faculty. Under special circumstances, the dean of the Graduate College may approve a substitute chairman. Each doctoral committee must have at least one member of the Graduate Faculty from outside the student's major department.

The student should consult the members of the advisory committee frequently and keep them informed on the progress of his or her work.

Preliminary Conference. As soon as the student is notified that an advisory committee has been approved, the student should arrange with the chairman for a conference with the committee. During the conference, the preparation and qualifications of the student for graduate work will be discussed and appropriate plans made for future study.

Plan of Study. After the preliminary conference, the student should complete the plan of study for the degree, have it approved by the advisory committee, file two copies in the Graduate College and two copies with the advisory committee, and retain one for the student's personal file.

The plan must include all the acceptable graduate work that has been completed and all that will be taken for the degree. The plan should include approximately 75 percent of courses at the 5000-6000 level and at least 15 hours of thesis credit. Forms for preparing the plan of study will be sent to the student by the Graduate College. Because the acceptance of work which the student desires to use toward the degree rests with the advisory committee, it is important to plan a complete program and have it approved by the dean of the Graduate College as soon as possible.

The plan of study is to be submitted prior to the pre-enrollment date during the second full semester of enrollment (beyond the master's degree).

Changes in the plan can be made with the approval of the advisory committee and the dean of the Graduate College. A final, accurate and approved plan must be filed at the beginning of the semester or summer session in which the degree is to be conferred.

Minor Subject or Field. As a means of giving depth and breadth to their doctoral programs, most departments require work in a minor field or at least a selection of extra-departmental courses. To minor in a subject or field, as a minimum, the graduate student must complete graduate level work beyond requirements for an undergraduate degree in the minor department. A department in which a student indicates a minor must certify to the dean of the Graduate College the satisfactory completion of requirements for a minor.

Character of Work. The satisfactory completion of course work (see "General Regulations") is only one requirement for receiving the degree. The student must also (1) pass a qualifying examination, (2) prepare an acceptable dissertation, (3) demonstrate the ability to do independent study, (4) show qualities of leadership in the chosen field, (5) pass a final examination, and (6) comply with other requirements of the major department.

Residence Requirements. A minimum of 30 semester credit hours must be taken in residence at Oklahoma State University. All credit accepted toward the degree beyond the master's degree must be on the student's plan of study and be approved by the advisory committee.

One year of the last two years must be spent in continuous residence at this institution.

With prior approval by the advisory committee and the dean of the Graduate College, the stu-
dent may do research for the degree in absentia. Research conducted while not in residence is under the supervision of the major adviser and the advisory committee.

Courses taken at the University Center at Tulsa (UCT) while registered through Oklahoma State University are considered residence credit.

Language Requirement. Foreign language or other proficiency requirements may be specified to meet the need for specific skills and areas of knowledge that facilitate research and contribute to wider understanding. Specific requirements are determined by degree-granting departments or programs. In many fields, a reading knowledge of one or two modern foreign languages is an important part of scholarship and necessary for research. In other fields, proficiency in special and related disciplines may be required that will contribute to the needs of the individual program.

Qualifying Examination. The qualifying examination is comprehensive, covering the entire area of the student's graduate study. The examination may be all written or part written and part oral. The examination must be passed not less than six months before the degree is granted (see "Admission to Candidacy"). The results of the examination are reported to the Graduate College on Form G-4.

Before taking the qualifying examination, the student must have an approved plan of study on file in the Graduate College, have the approval of the advisory committee, and the approval of the dean of the Graduate College.

In case of failure to pass any part of this examination, the student will be notified in writing of the conditions under which another examination can be taken. A second examination may not be given earlier than four months after a failure.

If the results of the second examination are unsatisfactory, no other examination may be given without the approval of the Graduate Council.

Admission to Candidacy. A student must be admitted to candidacy at least six months before the commencement in which the Doctor of Philosophy degree will be received.

Before being admitted to candidacy, the student must have passed the qualifying examination, and have an approved plan of study and thesis outline filed in the Graduate College.

Dissertation. A dissertation (doctoral thesis) is required of each doctoral candidate. The subject of the dissertation must be approved by the advisory committee and the dissertation is prepared under the direction of members of the committee or a special thesis committee approved by the advisory committee chairperson.

The dissertation must follow specifications in the Graduate College Style Manual, available from the Graduate College. All dissertation copies must have the necessary approval signatures before submission to the Graduate College.

After completing the research, the student prepares a final draft copy (complete and legible) of the proposed dissertation and submits a copy, along with the abstract, to each member of the committee and to the Graduate College. The copy being submitted to the Graduate College must be approved by the student's thesis adviser. When the final draft copy is submitted, the title must be final and any request for waiver of Graduate College Style Manual recommendations must be made. The proof copy must be submitted to the Graduate College no later than the stated deadline (see "Graduate College Calendar").

Final Examination. Permission to administer the final examination is requested from the dean of the Graduate College on Form T-1, which must contain the signature of each member of the committee, indicating each has received the dissertation and concurs in the request to administer the final examination. The chairperson also uses Form T-1 to propose a specific time and place for the examination.

The final examination is primarily a defense of the dissertation. If the defense is judged inadequate, a re-examination decision will be made by the examining committee. The examination is open to all members of the Graduate Faculty and may be attended by anyone else who obtains the permission of the committee.

The committee will notify the Graduate College immediately of results of the final examination on Form T-2. Following satisfactory completion of the final examination, the candidate will make any changes required by the committee and by the Graduate College and submit the dissertation in final form signed by the committee to the Graduate College.

Three copies of the dissertation in final form and six copies of the abstract must be submitted to the Graduate College no later than the stated deadline (see "Graduate College Calendar"). The final copies of the dissertation are accompanied by Form T-3. The dissertation copies become the property of the University; two copies are filed in the Library and one copy is kept by the major department. There is a binding fee, payable at the Office of the Bursar.

All dissertations are microfilmed by University Microfilms, Inc. The student is required to pay a fee for microfilming the complete document and for publication of an abstract of about 350 words. The student must complete a University Microfilms Agreement Form after the dissertation has been accepted by the Graduate College. Copyrighting the dissertation is not required, but can be done at a small additional cost with the approval of the dean of the Graduate College.

Doctor of Education Degree Programs (Ed.D)

Agricultural Education
Applied Behavioral Studies
Counseling and Student Personnel
Curriculum and Instruction
Educational Administration
Higher Education
Home Economics Education and Community Services
Occupational and Adult Education

The degree of Doctor of Education is a professional degree conferred in recognition of outstanding ability as an educator in some special field or fields as shown by: (1) satisfactory completion of a program of study; (2) passing examinations showing an understanding of the field of specialization and its relation to allied subjects; (3) the preparation of a dissertation demonstrating ability to approach problems with a high degree of originality and independence; and (4) passing an examination covering the dissertation and related fields.

Time Limit. Students are expected to complete the requirements of the Ph.D. degree within six years after filing a Notice of Intention. (The Notice of Intention is filed during the first semester of the doctoral program.) After that time a new program of study must be arranged with the advisory committee and filed in the Graduate College.

If all requirements for the degree are not completed within four years after the qualifying examination was passed, a second qualifying examination must be repeated successfully.

Continuous Enrollment. A graduate student must maintain continuous enrollment during the entire research phase of the program. Such enrollment is not limited by the maximum number of credit hours of thesis which apply to the degree. Continuous enrollment can be met with six credit hours per year or two credit hours in each of the fall, spring and summer semesters.
### Summary of Procedure for Doctoral Degree

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Apply for admission. (Follow instruction sheet carefully.) Initiate through Dean Approved by Dean</td>
</tr>
<tr>
<td>2.</td>
<td>Secure assignment of temporary adviser from major department head and enroll. DH &amp; TA Dean</td>
</tr>
<tr>
<td>3.</td>
<td>File Notice of Intention to become a candidate for the degree. Obtain forms in Graduate College. Dean</td>
</tr>
<tr>
<td>4.</td>
<td>Provide temporary adviser with information as required to evaluate admissibility to program. TA Dean</td>
</tr>
<tr>
<td>5.</td>
<td>On favorable action of appropriate Graduate Faculty group with respect to admission to program, request the appointment of advisory committee. Comm Dean</td>
</tr>
<tr>
<td>6.</td>
<td>Prepare plan of study with assistance of committee. Submit two approved copies to Graduate College and two to the advisory committee. Comm Dean</td>
</tr>
<tr>
<td>7.</td>
<td>Fulfill foreign language requirement or attain other required proficiencies. TA Dean</td>
</tr>
<tr>
<td>8.</td>
<td>Complete major portion of course work and plan thesis program with committee. Submit copy of approved thesis outline to Graduate College. Ch Dean</td>
</tr>
<tr>
<td>9.</td>
<td>Apply for and take qualifying examination. Ch Dean</td>
</tr>
<tr>
<td>10.</td>
<td>Submit results of qualifying examination and/or application for admission to candidacy (Form G-4). Comm Dean</td>
</tr>
<tr>
<td>11.</td>
<td>Verify accuracy of plan of study in Graduate College. Secure committee approval for any necessary changes. Check on six-year time limit for the degree. Comm Dean</td>
</tr>
</tbody>
</table>

#### Preliminary Conference

As soon as the student is notified that an advisory committee has been appointed, a conference should be arranged with the chairman and committee. Before the conference the student must see that the chairman has transcripts of previous work and other information that will be needed in the conference. During the conference the preparation of the student for graduate study will be discussed and plans made for future study.

#### Plan of Study

After the preliminary conference, the student should complete the plan of study for the degree, and have five copies approved and signed by the advisory committee. One copy will be retained by the student, two copies left with the major adviser, and two copies sent to the Graduate College. 

The plan must include all the acceptable graduate work that has been completed and all that will be taken for the degree. The plan should include approximately 75 percent of courses at the 5000-6000 level and at least 15 hours thesis credit. Forms for preparing the plan of study will be sent to the student by the Graduate College.

Because the acceptance of work which the student desires to use toward the degree rests with the advisory committee, it is important to plan a complete program and have it approved by the...
12. Complete the Application for Diploma card at the time of enrollment.

Dean

At the time of enrollment for the semester or session in which degree is to be conferred. (Application is good for stated time only. File new application if conferring of degree is delayed.)

13. Complete research, prepare final draft copy of dissertation and submit it at least one week prior to the examination, along with a copy of the abstract, to each member of the committee and to the Graduate College. The final draft must be complete and legible. Ordinary proofreading marks and minor handwritten additions, changes, etc., are permitted, but the copy should be in such condition that it can be read easily and understood clearly. The format must follow the Graduate College Style Manual recommendations, unless a waiver is requested by the major adviser. Any request for waivers should be submitted along with the dissertation final draft copy. The dissertation title must be correct and cannot be changed since it will appear in the Commencement Program. The adviser must sign the copy submitted to the Graduate College.

Ch
Comm
Dean

Deadlines published yearly.

14. Advisory committee members formally acknowledge receipt of dissertation and concur in request to administer final examination to candidate (Form T-1).

Comm
Dean

15. Committee chairman notifies Graduate College of the examination results immediately following conclusion of the examination (Form T-2).

Ch
Dean

16. Make any changes in dissertation required by examining committee and by the Graduate College. Advisory committee members sign final copies of dissertation. The dissertation is submitted to the Graduate College, which makes the final decision on acceptance of the dissertation. Candidate submits at least three approved copies of the dissertation and six approved copies of the abstract along with clearance check (Form T-3) signed by the student and the major adviser.

Ch
Comm
Dean

Deadlines published yearly.

17. Pay binding and microfilming fees in Bursar's Office; complete questionnaire and microfilming agreement form and return all forms to the Graduate College.

Form to be obtained from the Graduate College after dissertation has been formally accepted by that office.

18. Rent or buy cap, gown, and hood at Student Union Bookstore and attend Commencement.

 dean of the Graduate College as soon as possible.

The plan of study is to be submitted prior to the pre-enrollment date during the second full semester of enrollment (beyond the master's degree).

Changes in the plan can be made with the approval of the advisory committee and the dean of the Graduate College. A final, accurate and approved plan must be filed at the beginning of the semester or summer session in which the degree is to be conferred.

Character of Work. Completing a number of courses with a "B" average (see “General Regulations”) is one of the requirements for the doctoral degree. The student must also (1) pass a qualifying examination, (2) prepare an acceptable dissertation, (3) demonstrate the ability to do independent study, (4) show qualities of leadership in the chosen field, (5) pass a final examination, and (6) comply with other requirements of the major field or department.

Residence Requirements. A minimum of 30 semester credit hours must be taken in residence at Oklahoma State University. One academic year of the last two as determined by the appropriate department must be spent in continuous residence at this institution.

The residence requirement can be met by two semesters of full-time graduate study. Any other way of meeting the residence requirement must have the approval of the student’s advisory committee and of the dean of the Graduate College.

Courses taken at the University Center at Tulsa (UCT) while registered through Oklahoma State University are considered residence credit. Courses taken from the other three cooperating universities are considered to be transfer credit.

Foreign Language and Research Instruments Proficiency. All candidates will be expected to have a command of those instruments necessary in the study of educational problems. The doctoral advisory committee of each candidate may require evidence of proficiency in one or more foreign languages, educational research, statistics, and computer usage.

Qualifying Examination. Before taking the qualifying examination, the student must have completed the main areas in a plan of study which has been approved by the advisory committee, have permission of the dean of the Graduate College to take the qualifying examination, have the approval of his or her advisory committee, and have an approved outline for the dissertation on file in the Graduate College and in the office of the department concerned.

The qualifying examination is designed to measure the student’s proficiency in the field of specialization, the breadth and depth of his or her professional education background and his or her knowledge of cognate subjects. The examination may be both written and oral but part of it must be written. This examination must be passed and the result reported to the Graduate College on Form G-4 at least six months before the degree is granted (see “Admission to Candidacy” in the “Doctor of Philosophy” section). In case of failure to pass this examination, the student will be notified by the examining committee of the condition under which another examination may be taken. A student who fails on either the qualifying or final examination cannot take another examination for four months. If the result of the second examination is unsatisfactory, no other examination may be given without the approval of the Graduate Council.

Dissertation. A dissertation (doctoral thesis) is required of each candidate for the Doctor of Education degree. The dissertation has three principal functions: (1) training in research, (2) promoting professional growth, and (3) contributing to professional knowledge in education. Not every dissertation will be expected to serve these three functions in the same way or to the same extent. The format specifications, procedures, and regulations for the dissertation are the same as for the Ph.D. The Ed.D. candidate should refer to the “Doctor of Philosophy” section on dissertations and submission procedures through the Graduate College.

Time Limit. Students are expected to complete the requirements for the Doctor of Education degree within six years after filing a Notice of Intention. (The Notice of Intention is filed during the first semester of the doctoral program.) Otherwise a new program of study must be arranged with the advisory committee and filed in the Graduate College.

If all requirements for the degree are not completed within four years after the qualifying examination was passed, a second qualifying examination must be repeated successfully.
Continuous Enrollment. Continuous enrollment must be maintained during the entire research phase of the program. Such enrollment is not limited by the maximum number of credit hours of thesis which apply to the degree. Continuous enrollment can be met with six credit hours per year or two credit hours in each of the fall, spring and summer semesters.

Specialist in Education Degree Programs (Ed.S.)

Counseling and Student Personnel
Curriculum and Instruction
Educational Administration
Higher Education
Occupational and Adult Education

The Specialist in Education degree is conferred as an appropriate recognition of achievement as evidenced by:

1. Successful professional performance in the area of the student's specialization.
2. Satisfactory completion of a program of graduate study of approximately two academic years.
3. Satisfactory performance on examinations designed to reveal the student's undertaking of the field of specialization and its relation to other areas.
4. Preparation of a thesis dealing with some aspect of concern to the student's profession and its defense before a committee of the Graduate Faculty.

Programs leading to the Specialist in Education degree are offered at present only with the Teacher Education Group.

Admission. The student can secure application forms from the dean of the Graduate College along with information concerning areas and programs of study offered. The application will be evaluated by the faculty of the appropriate department and by the Graduate College and qualified applicants will be admitted provisionally for study toward the Specialist in Education degree.

Admission to a Program. The student planning to seek the Specialist in Education degree must complete a personnel folder which includes a vita and letters of recommendation as requested by the College of Education, transcripts, protocols of scholarly work and test scores. Test scores required are the Miller Analogies Test and/or the aptitude portion of the Graduate Record Examination. A student should contact the department head to determine which tests are required and obtain materials concerning the personnel folder.

When the student's personnel folder is complete, the graduate review committee for Specialist in Education programs will review the student's records and recommend to the dean of the Graduate College whether or not the student should be admitted to the program. The dean of the Graduate College will inform the student by letter regarding admission.

Notice of Intention. Before taking additional courses after completing the requirements for a master's degree, a student who expects to work toward the Specialist in Education degree should file in the Graduate College a Notice of Intention to become a candidate for the degree. The Notice of Intention form can be obtained from the Graduate College. Unless the form is filed, courses taken may not count toward the degree. The "Notice of Intention" is to be filed prior to midsemester of the first semester of enrollment beyond the master's degree, or prior to the second summer enrollment.

Temporary Adviser. Upon receiving a Notice of Intention from a student to become a candidate for the Specialist in Education degree, the dean of the Graduate College will designate a member of the Graduate Faculty to serve as temporary adviser to the student. The temporary adviser will guide the student in the selection of courses for the first semester or summer session.

Advisory Committee. If the recommendation of the graduate review committee is favorable, the dean of the Graduate College will appoint an advisory committee nominated by the head of the department in which the student wishes to specialize. This committee (1) conducts the preliminary examination and conference, (2) approves the proposed plan of study, (3) supervises the student's progress in the program, (4) supervises on the study, and (5) arranges for and conducts the final examination.

Plan of Study. As soon as practicable after the appointment of the committee, the student will arrange with the chairman for a conference for the purpose of planning a program of study. The plan of study will include all graduate work required to complete the program. It will be filed, in duplicate, in the Graduate College. This plan may be modified with the approval of the advisory committee and the dean of the Graduate College.

Credit-hour Requirements. A minimum of two academic years of full-time graduate study, or equivalent (a minimum of 60 semester credit hours beyond the baccalaureate degree), is required for the Specialist in Education degree. This may include as many as 10 credit hours for the practicum study and accompanying report.

Character of Work. Completing an appropriate number of courses with a "B" average (see "General Regulations") is only one of the requirements for this degree. The student must also (1) pass a qualifying examination, (2) conduct an appropriate study of education, (3) show qualities of professional leadership, and (4) pass a final examination.

Residence Requirements. The candidate must be enrolled full-time in residence study for one academic year of the two years required for the degree. Two summer sessions are considered equivalent to one semester for purposes of meeting the residence requirement.

Ordinarily the last 20 hours, including the study and report, must be earned in residence on the Stillwater campus of Oklahoma State University. Any deviation must be recommended by the advisory committee and approved by the dean of the Graduate College.

Qualifying Examination. A qualifying examination is required of all candidates for the Specialist in Education degree. Conditions governing it are essentially similar to those required for candidates for the Ed.D. (see "Doctor of Education" section).

Other Regulations. Other requirements for the Specialist in Education degree are similar to those for the Ed.D. (see "Doctor of Education" section).

Time Limit. The time limits applicable to candidates for the Specialist in Education degree are the same as those which apply to the Ed.D. candidate.
Graduate Faculty

The four groups of the Graduate Faculty are full members and emeriti, and associate members and emeriti. Members of the Graduate Faculty, their degrees held and degree-granting institutions, and most recent academic title at OSU are listed below. Dates following indicate: first, the year that the faculty member was appointed to his or her present position; second, the year that the faculty member was initially appointed to a position at Oklahoma State University. A single date means that these two coincided. Dates in parentheses represent periods not at OSU.

Members

MOHAMED ABDEL-HADY, B.C.E. (Ein-Shams Univ., Cairo), M.S. (Univ. of Illinois), Ph.D. (ibid); P.E.; Professor of Civil Engineering; 1971, 1963.

BRUCE J. ACKERSON, B.S. (Univ. of Nebraska), M.S. (Univ. of Colorado), Ph.D. (ibid); Professor of Physics; 1986, 1977.


MOHAMED SAMIR AHMED, B.S. (Ein-Shams Univ., Cairo), M.S. (McGill Univ.), Ph.D. (Univ. of Oklahoma); P.E.; Associate Professor of Civil Engineering; 1984, 1980.

DOUGLAS B. AICHELE, A.B. (Univ. of Missouri), A.M. (ibid), Ed.D. (ibid); Professor and Head of the Department of Curriculum and Instruction; 1980, 1969.

ZUHAIR F. AL-SHAIEB, B.S. (Univ. of Damascus), M.S. (Univ. of Missouri-Rolla), Ph.D. (ibid); Professor of Geology; 1981, 1972.

CRAIG ALLISON, B.A. (Rice Univ.), M.S. (Univ. of Illinois at Urbana-Champaign), Ph.D. (ibid); Associate Professor of Physics; 1988, 1983.

H. JACK ALLISON, B.S. (Louisiana State Univ.), M.S. (ibid), Ph.D. (O.S.U.); P.E.; Professor of Electrical and Computer Engineering; 1976, 1961.

DALE E. ALSPACH, B.S. (Univ. of Akron), Ph.D. (Ohio State Univ.); Professor of Mathematics; 1985, 1979.

ORLEY M. AMOS, JR., B.A. (Wichita State Univ.), M.S. (Iowa State Univ.), Ph.D. (ibid); Professor of Economics; 1988, 1979.

KIM B. ANDERSON, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Associate Professor of Agricultural Economics; 1985, 1982.

MICHAEL APPLEGATE, B.A. (Brigham Young Univ.), Ph.D. (Iowa State Univ.); Associate Professor of Economics; 1978, 1974.

DALE ELLSWORTH ARMSTRONG, B.A. (Centenary College), M.P.A. (Univ. of Texas), Ph.D. (ibid); Associate Professor of Accounting; 1967, 1965.

LYNN A. ARNEY, B.S. (Univ. of Tulsa), M.E. (Northeastern Oklahoma State Univ.), Ed.D. (O.S.U.); Associate Professor of Educational Administration and Higher Education; 1988, 1985.

RICHARD ARTHUR AUKERMAN, B.S. (Univ. of North Dakota), M.S. (ibid), Ph.D. (ibid); Professor of Management; 1987, 1980.

JOHN THOMAS BALE, JR., B.S. (O.S.U.),
CAROLYN JUNE BAUER BAIRD,
DANIEL DELANO BADGER, B.S. (Virginia
KENNETH DARRELL BERLIN, B.A. (North
RICHARD C. BERBERET, B.A. (Carroll
WILLIAM ROGER BILES, B.A. (Univ. of Illinois,
JAMES E. BOSE, B.S. (O.S.U.), M.S. (ibid),
Professor of Applied Behavioral Studies and
Professor of Health, Physical Education and Leisure,
Coordinator, and Coordinator of Graduate Studies;
ALFRED CARLOZZI, B.A. (Iona College), M.A. (Trinity Univ.),
Associate Professor of Applied Behavioral Studies;
GEORGE OLIVIA CARNEY, B.A. (Central
M. (ibid), Professor of Geography;
BRIAN J. CARTER, B.S. (Rutgers Univ.), M.S.
Professor of Psychology;
TRACY S. CARTER, B.S. (Iowa State Univ.),
Professor of Zoology; Visiting Assistant Professor of Zoology;
BRETT E. CARVER, B.S. (Univ. of Georgia),
M.S. (North Carolina State Univ.), Ph.D. (ibid); Associate Professor of Agriculture;
KENNETH E. CASE, B.S.E.E. (O.S.U.),
M.S.I.E. (ibid), Ph.D. (ibid); Regents Professor of Industrial Engineering and Management;
KATHRYN CASTLE, B.A. (Univ. of Oklahoma),
M.A. (Emory Univ.), Ed.D. (Univ. of Virginia); Professor of Curriculum and Instruction;
JAMES W. COGDELL, B.A. (Yale Univ.), Ph.D.
Professor of Zoology; 1975, 1970.
DONNA H. BRANSON, B.A. (Rosary College),
M.S. (Univ. of Rhode Island), Ph.D. (Michigan State Univ.);
Professor of Clothing, Textiles and Merchandising;
M. (ibid);
Professor of History and Director of the Division of Engineering Technology;
1985.
JAMES E. BREAZILE, B.S. (Univ. of Missouri),
D.V.M (ibid), Ph.D. (Univ. of Minnesota); Professor of Pathological Science and Director of Laboratory Animal Resources; 1966, 1978.
ANTHONY EDWARD BROWN, B.A. (Baylor Univ.),
M.A.P.A. (Univ. of Tennessee), Ph.D. (ibid);
Associate Professor of Political Science and Coordinator of Programs, University Center at Tulsa; 1988, 1980.
DONALD N. BROWN, B.A. (Harvard Univ.),
M.A. (Univ. of Arizona), Ph.D. (ibid); Professor of Sociology; 1982, 1971.
LARRY TODD BROWN, B.A. (Univ. of Kentucky),
RALPH W. BRUNKEN, B.S. (Univ. of Wisconsin),
Ph.D. (Michigan State Univ.); Professor of Agricultural Economics; 1980, 1969.
GEORGE OLIVIA CARNEY, B.A. (Central
M. (ibid), Professor of Mathematics;
JOHN LEVIS CADDEL, B.S. (Texas A. & I.
Professor of Zoology; 1977, 1961.
JOSEPH F. BYRNES, B.A., B.D. (Montfort
Regents Professor of Biology; 1984, 1977.
GEORGE E. BURROWS, B.S. (Univ. of California, Davis), D.V.M., M.S.
Washington State Univ.), Ph.D. (ibid); Professor of Physiological Science; 1983, 1978.
ROBERT L. BURTON, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Professor of Entomology;
D. (ibid);
Professor of Psychology; 1981, 1977.
H. STEPHEN CALDWELL, A.B. (Hanover College),
M.S. (DePauw Univ.), Ph.D. (Purdue Univ.); Professor of Psychology; 1980, 1971.
J. CAMPBELL, B.S. (Univ. of Missouri),
M.S. (ibid), Ph.D. (ibid); Professor of Animal Science and President; 1988.
NOMA JO CAMPBELL, B.S. (O.S.U.), M.S. (Kansas State Univ.), Ed.D. (Virginia Polytechnic Inst. and State Univ.);
Professor of Applied Behavioral Studies and Director of the University Testing and Evaluation Service; 1981, 1975.
LOWELL CANEDAY, B.A. (Le Tourneau College), M.A. (Univ. of Wyoming), Ph.D.
(University of Minnesota); Associate Professor of Health, Physical Education and Leisure, Coordinator, and Coordinator of Graduate Studies; 1986, 1981.
ALFRED CARLOZZI, B.A. (Iona College), M.A. (Trinity Univ.),
Associate Professor of Applied Behavioral Studies; 1983, 1978.
GEORGE OLIVIA CARNEY, B.A. (Central
M. (ibid), Professor of Geography;
BRIAN J. CARTER, B.S. (Rutgers Univ.), M.S.
Professor of Psychology; 1987, 1980.
TRACY S. CARTER, B.S. (Iowa State Univ.),
Professor of Zoology; Visiting Assistant Professor of Zoology;
BRETT E. CARVER, B.S. (Univ. of Georgia),
M.S. (North Carolina State Univ.), Ph.D. (ibid); Associate Professor of Agriculture;
KENNETH E. CASE, B.S.E.E. (O.S.U.),
M.S.I.E. (ibid), Ph.D. (ibid); Regents Professor of Industrial Engineering and Management;
KATHRYN CASTLE, B.A. (Univ. of Oklahoma),
M.A. (Emory Univ.), Ed.D. (Univ. of Virginia); Professor of Curriculum and Instruction;
JAMES W. COGDELL, B.A. (Yale Univ.), Ph.D.
Professor of Zoology; 1975, 1970.
DONNA H. BRANSON, B.A. (Rosary College),
M.S. (Univ. of Rhode Island), Ph.D. (Michigan State Univ.);
Professor of Clothing, Textiles and Merchandising;
M. (ibid);
Professor of History and Director of the Division of Engineering Technology;
1985.
JAMES E. BREAZILE, B.S. (Univ. of Missouri),
D.V.M (ibid), Ph.D. (Univ. of Minnesota); Professor of Pathological Science and Director of Laboratory Animal Resources; 1966, 1978.

LAZY I. CROY, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Illinois); Professor of Agronomy; 1978, 1955.

ROBERT EMMETT DARCY, B.A. (Univ. of Wisconsin), M.A. (Univ. of Kentucky), Ph.D. (ibid); Professor of Political Science; 1985, 1977.

ROBERT C. DAUFFENBACH, B.A. (Wichita State Univ.), M.A. (ibid), Ph.D. (Univ. of Illinois); Professor of Economics and Director of Business and Economic Research; 1987, 1977.

WILLIAM P. DAWKINS, B.A. (Rice Institute), B.S.C.E. (ibid), M.S. (ibid), Ph.D. (Univ. of Illinois); Professor of Civil Engineering; 1973, 1969.

JOSEPH PAUL DELVIN, B.S. (Regis College), Ph.D. (Kansas State Univ.); Professor of Chemistry; 1970, 1961.

GEORGE SUMTER DIXON, Jr., B.S. (Univ. of Georgia), M.S. (ibid), Ph.D. (ibid); Professor of Physics; 1985, 1970.

JUDITH SHELTON DOBSON, B.S. (Univ. of Wisconsin), M.S. (Univ. of Nebraska), Ph.D. (ibid). Associate Professor of Applied Behavioral Studies; 1977, 1971.

RUSSELL LEE DOBSON, B.A. (Northeastern State College, Oklahoma), M.T. (ibid), Ed.D. (Univ. of Oklahoma); Professor of Curriculum and Instruction; 1973, 1967.

RICHARD A. DOEBLE, B.S. (Univ. of Kansas), M.A. (ibid), Ph.D. (ibid); Professor of Sociology; 1980, 1969.

GERALD ARTHUR DOEKSEN, B.S. (South Dakota State Univ.), M.S. (O.S.U.), Ph.D. (ibid); Regents Professor of Agricultural Economics; 1986, 1978.


NORMAN NEVILL DURHAM, B.S. (North Texas State Univ.), M.S. (ibid), Ph.D. (Univ. of Texas); Professor of Microbiology and Director of the Graduate Program in Microbiology; 1984, 1978.

LEA L. EBRO, B.S. (Univ. of the Philippines), B.S., M.S. (Iowa State Univ.), Ph.D. (Ohio State Univ.); Professor and Interim Head of the Department of Food, Nutrition, and Institution Administration; 1984, 1978.

ANTHONY A. ECHELLE, B.S. (Southwestern Oklahoma State Univ.), M.S. (Univ. of Oklahoma), Ph.D. (ibid); Professor of Zoology; 1985, 1980.

CHARLES K. EDGLEY, B.A. (Wayland College), M.A. (Texas Tech Univ.), Ph.D. (State Univ. of New York-Buffalo); Professor and Head of the Department of Sociology; 1982, 1972.


STEVEN WILLIAM EDWARDS, B.P.E. (Purdue Univ.), M.S. (ibid), Ph.D. (ibid); Associate Professor of Health, Physical Education and Leisure; 1984, 1982.

RICHARD W. EGGERMAN, B.A. (Univ. of Missouri, Rolla), M.S. (ibid), Ph.D. (ibid); Associate Professor of Chemical Engineering; 1986, 1983.

JOSEPH CARL FOX, B.S. (Brigham Young Univ.), M.S. (ibid), Ph.D. (Montana State Univ.); Associate Professor of Veterinary Parasitology, Microbiology and Public Health; 1981.

STANLEY F. FOX, M.S. (Univ. of Illinois), M.Phil. (Yale Univ.), Ph.D. (ibid); Associate Professor of Zoology; 1982, 1977.

DAVID A. FRANCKO, B.S. (Kent State Univ.), M.S. (ibid), Ph.D. (Michigan State Univ.); Associate Professor of Botany and Director of Research of the College of Arts and Sciences; 1985, 1981.

JOYCE S. FRISKE, B.S. (O.S.U.), M.Ed. (Univ. of Texas, Austin), Ph.D. (ibid); Associate Professor of Curriculum and Instruction; 1988, 1979.

DONALD KARL FROMME, B.M. (Boston Univ.), Ph.D. (Univ. of Iowa); Professor of Psychology; 1976, 1967.

ROBERT WESLEY FULTON, B.S. (O.S.U.), M.S. (Washington State Univ.), Ph.D. (Univ. of Missouri-Columbia), D.V.M. (O.S.U.); Professor and Head of the Department of Veterinary Parasitology, Microbiology and Public Health; 1986, 1982.


RONALD ROSS GAMBLE, B.S. (Central State College, Oklahoma), M.Ed. (Adams State College), Ph.D. (Univ. of Oklahoma); Professor of Applied Behavioral Studies; 1971, 1966.

SANDRA KAY GANGSTEAD, B.S. (Univ. of Wisconsin, LaCrosse), M.S. (Univ. of Wyoming), Ph.D. (Univ. of Utah); Associate Professor of Health, Physical Education and Leisure and Coordinator, Physical Education; 1979, 1979.

SANTIAGO GARCIA, B.A. (Instituto No. 1, Havana, Cuba), M.A. (Univ. of Oriente), Ph.D. (Univ. of Pittsburgh); Professor of Foreign Languages and Literatures; 1985, 1979.

JOHN JACOB GARDINER, B.A. (Univ. of Florida), Ph.D. (ibid); Professor of Educational Administration and Higher Education; 1987, 1979.

RODNEY D. GIESELT, B.S. (Univ. of Nebraska), M.S. (ibid), Ph.D. (Univ. of Florida); Associate Professor of Animal Science; 1986, 1982.

JOHN I. GELDER, B.S. (Western Washington Univ.), M.S. (Univ. of Wisconsin), Ph.D. (Univ. of Arkansas); Associate Professor of Chemistry; 1982, 1977.

AFSHIN J. GHAJAR, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Associate Professor of Mechanical and Aerospace Engineering; 1985, 1981.

ROBERT KARL GHOUSON, B.A. (Univ. of Chicago), B.S. (Univ. of Illinois), Ph.D. (ibid); Professor of Biochemistry; 1985, 1968.

AMIT GHOSH, B.Sc. (Imperial College-London), Phi. (Nottingham Univ.); Associate Professor of Mathematics; 1987, 1983.


ROBERT L. GILLEN, B.S. (Colorado State Univ.), Ph.D. (Oregon State Univ.); Associate Professor of Agronomy; 1988, 1983.
KENNETH L. KING, B.A. (Southwestern State College, Oklahoma), M.Ed. (Univ. of Oklahoma), Ed.D. (ibid), Associate Professor of Curriculum and Instruction, Dean of the College of Education, and Director of Teacher Education: 1989, 1972.


JAMES LAWLER, B.A. (Univ. of Pittsburgh), M.A. (ibid), M.P.I.A. (ibid), J.D. (Harvard Univ.), Ph.D. (Univ. of Pittsburgh); Professor of Political Science: 1980, 1970.

EDWARD G. LAWRY, B.A. (Fordham Univ.), M.S. (Univ. of Pittsburgh), Ph.D. (Univ. of Texas); Associate Professor and Head of the Department of Philosophy: 1985, 1971.

FRANKLIN ROLLIN LEACH, B.A. (Hardin-Simmons Univ.), Ph.D. (Univ. of Texas); Professor of Biochemistry: 1963, 1959.

LEONARD J. LEFF, B.B.A. (Univ. of Texas), Austin), M.A. (Univ. of Houston), Ph.D. (Northern Illinois Univ.); Associate Professor of English: 1983, 1979.


LARRY J. LITTLEFIELD, B.S. (Cornell Univ.), M.S. (Minnesota Univ.), Ph.D. (ibid); Professor and Head of the Department of Plant Pathology: 1985.

JOHN P. LODVIG, B.S. (Univ. of Illinois), M.S. (ibid), Ph.D. (ibid); P.E.; Professor of Civil Engineering: 1981, 1970.


NEIL ROBERT LUEBKE, A.B. (Midland College), M.A. (Johns Hopkins Univ.), Ph.D. (ibid); Professor of Philosophy: 1979, 1961.

KEITH S. LUSBY, B.S. (Kansas State Univ.), M.S. (ibid), Ph.D. (O.S.U.); Professor of Animal Science: 1986, 1976.


JULIAN QUENTIN LYND, B.S. (Univ. of Arkansas), M.S. (Michigan State Univ.), Ph.D. (ibid); Professor of Agronomy: 1957, 1951.

GILBERT J. MAINS, B.S. (Duquesne Univ.), Ph.D. (Univ. of California); Professor of Chemistry: 1971.

HARRY PARKS MAPP, JR., B.S. (Virginia Polytechnic Inst.), M.S. (ibid), Ph.D. (O.S.U.); Regents Professor of Agricultural Economics: 1988, 1974.

JUAN MANUEL MARCOS, B.A. (National Univ., Asuncion), M.A. (Univ. of Pittsburgh), Ph.D. (Univ. of Madrid), Ph.D. (Univ. of Pittsburgh); Assistant Professor of Foreign Languages and Literatures: 1983.

JOEL JEROME MARTIN, B.S. (South Dakota School of Mines and Technology), M.S. (ibid), Ph.D. (Iowa State Univ.); Professor of Physics: 1979.

ROBERT L. MATTIS, B.S. (Hamline Univ.), Ph.D. (Univ. of Wisconsin); Associate Professor of Biochemistry: 1988, 1985.

ELIZABETH MAX, B.S. (Texas Woman's Univ.), M.S. (North Texas State Univ.), Ed.D. (O.S.U.); Associate Professor of Curriculum and Instruction: 1978, 1970.

CHARLES V. MAXWELL, B.S. (Univ. of Georgia), M.S. (ibid), Ph.D. (Univ. of Wisconsin); Professor of Animal Science: 1984, 1968.

CHARLES SIDNEY MCCAIN, M.S. (Univ. of Missouri), D.V.M.(Auburn Univ.); Associate Professor of Veterinary Parasitology, Microbiology and Public Health: 1981.

STEPHEN W. S. MCKEEVER, B.S. (Univ. of North Wales, Bangor), M.S. (ibid), Ph.D. (ibid); Associate Professor of Physics: 1989, 1985.


C. WARREN McCINNEY, B.S.Ed. (Georgia Southern College), M.Ed. (Georgia Southwestern College), Ed.D. (Univ. of Georgia); Professor of Curriculum and Instruction: 1988, 1987.


RONALD W. MCNEW, B.S. (Colorado State Univ.), M.S. (Purdue Univ.), Ph.D. (ibid); Professor of Statistics: 1980, 1970.

JAMES K. MECHRSON, B.S. (Univ. of Idaho), M.A. (Univ. of California), Ph.D. (ibid); Professor of Botany: 1982, 1968.


GARY K. MEEK, B.B.A. (Texas Christian Univ.), M.B.A. (ibid), Ph.D. (Univ. of Washington); Associate Professor of Accounting: 1984, 1980.

WALNE ALAN MEINHART, B.S. (Univ. of Illinois), M.S. (ibid), Ph.D. (ibid); Professor and Head of the Department of Management: 1988, 1962.

DAVID W. MEINKE, B.A. (College of Wooster), Ph.D. (Yale Univ.); Associate Professor of Botany: 1982, 1976.


EDWIN L. MILLER, B.S. (Iowa State Univ.), M.S. (ibid), Ph.D. (ibid); Associate Professor and Head of the Department of Forestry: 1989, 1980.

MELVIN D. MILLER, B.S. (Oregon State Univ.), M.S. (ibid), Ed.D. (ibid); Professor and Director of the School of Occupational and Adult Education: 1981.

RONALD K. MILLER, B.S.B.A. (Univ. of Missouri), M.B.A. (ibid), Ph.D. (ibid); Associate Professor of Finance and Director of Business Administration Graduate Studies: 1981.


STEPHEN J. MILLER, B.S.O. (I.S.U.), M.B.A. (ibid), Ph.D. (Univ. of California, Los Angeles); Professor of Marketing: 1979, 1971.


EARL DOUGLAS MITCHELL, JR., B.S. (Xavier Univ.), M.S. (Michigan State Univ.), Ph.D. (ibid); Professor of Biochemistry: 1987, 1986.
WILLIAM WALTER RAMBO, A.B. (Temple Univ.), M.A. (ibid), Ph.D. (Purdue Univ.); Professor of Psychology; 1966, 1956.


DARYL EUGENE RAY, B.S. (Iowa State Univ.), M.S. (ibid), Ph.D. (ibid); Professor of Agricultural Economics; 1978, 1971.

KARL NEVILLE REID, JR., B.S. (O.S.U.), M.S. (ibid), Sc.D. (Massachusetts Inst. of Technology); P.E.; Professor of Mechanical and Aerospace Engineering and Dean of the College of Engineering, Architecture and Technology; 1986, 1983.

MILTON D. RHOADS, B.S. (Central Michigan Univ.), M.S. (Michigan State Univ.), Ed.D. (ibid); Associate Professor of Curriculum and Instruction; 1977, 1969.

RONALD P. RHOTEN, B.S. (Univ. of Texas), M.S. (ibid), Ph.D. (ibid); Professor of Electrical and Computer Engineering; 1977, 1969.

MARY LYNN RICHARDS, B.S. (Michigan State Univ.), M.A. (ibid), Ph.D. (Univ. of Maryland); Associate Professor of Clothing, Textiles and Merchandising; 1985, 1976.

PAUL E. RICHARDSON, B.A. (Univ. of Kentucky), M.Ed. (Univ. of Cincinnati), M.A.T. (Univ. of North Carolina), M.S. (Univ. of Cincinnati), Ph.D. (ibid); Professor of Botany; 1982, 1968.

ROBERT L. RICHARDSON JR., B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); P.E.; Regents Professor and Head of the School of Chemical Engineering; 1987, 1965.

MARK G. ROCKLEY, B.A. (Hope College), Ph.D. (Univ. of Southampton); Professor of Chemistry; 1981, 1976.

MARY HELEN ROHRBERGER, B.A. (Newcomb College), M.A. (Tulane Univ.), Ph.D. (ibid); Professor of English and Director of Arts and Sciences Curricular Affairs and Academic Programs; 1983, 1961.

PETER CUSHING ROLLINS, B.A. (Harvard Univ.), Ph.D. (ibid); Professor of English; 1984, 1972.


JEFFIE FISHER ROSZEL, D.V.M. (Univ. of Pennsylvania); Associate Professor of Veterinary Pathology; 1978, 1971.

CHARLES CLAYTON RUSSELL, B.S.A. (Univ. of Florida), M.S.A. (ibid), Ph.D. (ibid); Professor of Plant Pathology; 1980, 1967.

JAMES R. RUSSELL, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Virginia Polytechnic Institute and State Univ.); Associate Professor of Agricultural Economics; 1981.

MARK AARON SAMUEL, B.S. (McGill Univ.), M.S. (ibid), Ph.D. (Univ. of Rochester); Professor of Physics; 1981, 1969.

MARK R. SANBORN, B.A. (Univ. of Northern Iowa), M.A. (ibid), Ph.D. (Iowa St. Univ.); Associate Professor of Microbiology; 1983, 1976.

HARJIT SANDHU, B.A. (Panjab Univ.), M.S. (ibid), Ph.D. (Iowa St. Univ.), Ph.D. (Panjab Univ.); Professor of Sociology; 1973, 1971.

ROBERT LEE SANDMEYER, B.S. (Fl. Hays Kansas State College), M.S. (O.S.U.), Ph.D. (ibid); Professor of Economics and Dean of the College of Business Administration; 1977, 1962.

KENNETH DOUGLAS SANDVOLD, B.S. (Concordia College), M.S. (Univ. of North Dakota), Ph.D. (Univ. of Illinois); Professor of Psychology; 1973, 1965.

SUBLAIAH SANGIACH, B.V.Sc. (Univ. of Madras), M.Sc. (ibid), Ph.D. (Purdue Univ.); Associate Professor of Physiological Science; 1986, 1981.

PAUL WILLIAM SANTELMANN, B.S. (Univ. of Maryland), M.S. (Michigan State Univ.), Ph.D. (Ohio State Univ.); Regents Service Professor of Agronomy; 1987, 1982.

JOHN R. SAUER, B.S. (St. John's Univ.), M.S. (New Mexico Highlands Univ.), Ph.D. (Tulane Univ.); Regents Professor of Entomology; 1987, 1969.

RAYMOND JOE SCHATZER, B.S. (Univ. of Missouri), M.S. (ibid), Ph.D. (Iowa State Univ.); Associate Professor of Agricultural Economics; 1988, 1983.

JOHN A. SCHILLINGER, B.A. (Monmouth College), M.A. (Univ. of Illinois), M.A. (Univ. of Wisconsin), Ph.D. (ibid); Professor and Head of the Department of Foreign Languages and Literatures; 1982.


ANNE L. Schneider, B.A. (O.S.U.), M.S. (Indiana Univ.); Professor and Head of the Department of Political Science; 1988, 1983.

DEAN FREDERICK SCHREINER, B.S. (Colorado State Univ.), M.S. (Iowa State Univ.), Ph.D. (ibid); Professor of Agricultural Economics; 1974, 1968.

ALAN CLARK SCHUERMANN, B.A. (Kansas State Univ.), M.S. (Chicana State Univ.), Ph.D. (Univ. of Arkansas); Professor of Industrial Engineering and Management; 1984.

CHARLES J. SCIFRES, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Nebraska); Professor and Head of the Department of Agronomy; 1987.

CHERYL MILLER SCOTT, B.S.R. (Purdue Univ.), M.A. (Northwestern Univ.), Ph.D. (Purdue Univ.); Associate Professor of Speech and Language Pathology and Audiology; 1977, 1972.

HUGH LAWRENCE SCOTT JR., B.S.R. (Purdue Univ.), Ph.D. (ibid); Professor of Physics; 1983, 1972.

WILLIAM CHARLES SCOTT, B.A. (Bethany College), M.A. (Texas Christian Univ.), Ph.D. (ibid); Professor of Psychology; 1982, 1968.

JAMES M. SEALS, B.S. (Abilene Christian Univ.), M.D. (Univ. of Arkansas); Professor of Plant Pathology; 1988, 1975.

EDWARD L. SMITH, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Minnesota); Regents Professor of Agronomy; 1988, 1966.


DONALD RAY SNETHEN, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Professor of Civil Engineering; 1988, 1979.

BRENT M. SNOW, B.S. (Brigham Young Univ.), M.S. (ibid), Ph.D. (Univ. of Idaho); Associate Professor of Applied Behavioral Studies; 1983, 1974.

JOHN BRUCE SOLIE, B.S. (Univ. of Maryland), J.D. (Creighton Univ.), Ph.D. (Univ. of Nebraska); Associate Professor of Agricultural Engineering; 1986, 1982.

JOHN L. SHERWOOD, B.S. (College of William and Mary), B.S. (Univ. of Maryland, College Park), Ph.D. (Univ. of Wisconsin-Madison); Associate Professor of Plant Pathology; 1988, 1981.

EVERETT C. SHORT, JR., B.S. (Kent State Univ.), Ph.D. (Univ. of Minnesota); Professor of Physiological Science; 1979.

WILLIAM ARTHUR SIBLEY, B.S. (Univ. of Oklahoma), M.S. (ibid), Ph.D. (ibid); Professor of Physics and Assistant Vice-President for Academic Affairs and Research; 1976, 1970.

WILLIAM GARY SIMPSON, B.B.A. (Texas Tech Univ.), M.B.A. (Southern Methodist Univ.), Ph.D. (Texas A & M Univ.); Professor of Accounting and Head of the Department of Finance; 1984, 1979.

LARRY L. SINGLETON, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Minnesota); Associate Professor of Plant Pathology; 1987, 1979.

GROVALYN FOREMAN SISLER, B.S. (O.S.U.), M.S. (ibid), Ed.D. (ibid); Professor and Head of the Department of Clothing, Textiles and Merchandising; 1976, 1965.

JAMES M. SMALLWOOD, B.S. (East Texas State Univ.), M.A. (ibid), Ph.D. (Texas Tech Univ.); Associate Professor of History; 1980, 1975.

RAMESH SHARDA, B.Eng. (Univ. of Udaipur), M.S. (Ohio State University), M.B.A. (Univ. of Wisconsin-Madison), Ph.D. (ibid); Associate Professor of Management; 1984, 1980.

JAMES H. SHAW, B.S. (Stephen F. Austin State College), M.F.S. (Yale Univ.), Ph.D. (ibid); Professor of Zoology; 1988, 1974.

RAVI SHEOREY, B.A. (Univ. of Nagpur), M.A. (Texas, Austin), Ph.D. (ibid); Associate Professor of English; 1966, 1981.

RAYMOND J. SIMPSON, B.A. (Univ. of Michigan), B.S. (Univ. of Michigan, College Park), Ph.D. (Univ. of Wisconsin-Madison); Associate Professor of Plant Pathology; 1984, 1981.
THEODORE ERNEST STALEY, B.A. (Carroll College), D.V.M. (Michigan State Univ.), M.S. (ibid); Professor of Physiological Science; 1982, 1965.

ROBERT FRANCIS STANNERS, B.S. (Univ. of Wisconsin), Ph.D. (Univ. of Iowa); Professor of Psychology; 1968, 1964.

JAMES KENNETH ST. CLAIR, B.A. (North Texas State Univ.), B.M. (ibid), M.M.E. (ibid), Ed.D. (Univ. of Texas); Professor of Educational Administration and Higher Education; 1968, 1964.

LARRY E. STEIN, B.S. (Iowa State Univ.), Ph.D. (Univ. of Illinois); Associate Professor of Physiological Science; 1986.

FRANK GEORGE STEINDL, B.A. (DePaul Univ.), M.S. (ibid), Ph.D. (ibid); Professor and Head of the Department of Botany and Microbiology; 1981, 1958.

DALE WILLIAM TOETZ, B.S. (Wisconsin) (Univ. of Wisconsin), M.S. (ibid), Ph.D. (Indiana Univ.); Professor of Zoology; 1980, 1965.

JAMES N. TRAPP, B.S. (Kansa State Univ.), M.S. (ibid), Ph.D. (Michigan State Univ.); Professor of Agricultural Economics; 1985, 1976.

VERNON TROXEL, B.S. (Illinois State Normal Univ.), M.Ed. (Univ. of Illinois), Ed.D. (ibid); Professor of Curriculum and Instruction; 1978, 1963.


WAYNE C. TURNER, B.S.E. (Virginia Polytechnic Inst. and State Univ.), M.S. (ibid), Ph.D. (Univ. of Virginia); Professor of Industrial Engineering and Management; 1986, 1974.

ADVHESH TYAGI, B.S. (University of Allahabad), M.S. (ibid), Ph.D. (Univ. of Roorkee), Ph.D. (Univ. of California-Berkeley); P.E.; Associate Professor of Civil Engineering; 1980.

RICHARD W. WHITNEY, B.S.A.E. (Kansas State Univ.), M.S. (ibid), Ph.D. (Univ. of Kansas); Professor and Head of the Department of Agricultural Engineering; 1985, 1980.

MARCIA TILLEY, B.S. (Iowa State Univ.), M.S. (Univ. of Florida), J.D. (ibid); Associate Professor of Agricultural Economics; 1988, 1982.

GLENN WILLIAM TODD, A.B. (Univ. of Miami), M.A. (ibid), Ph.D. (ibid); Professor and Head of the Department of Botany and Microbiology; 1981, 1958.

JOHN F. TOTH, B.S. (Purdue Univ.), M.S. (ibid), Ph.D. (Univ. of Missouri); Associate Professor of Animal Science; 1985, 1976.

DAVID C. ULLRICH, B.A. (Univ. of Wisconsin, Madison), M.A. (ibid), Ph.D. (ibid); Associate Professor of Mathematics; 1988, 1983.

JOHN N. VEESTRA, B.S. (Iowa State Univ.), M.S. (Univ. of Iowa), Ph.D. (ibid); Associate Professor of Civil Engineering; 1985, 1980.

ROBERT R. VENABLE, A.B. (Sacred Heart Seminary, M.Ed. (Wayne State Univ.), Ph.D. (Univ. of Michigan); Associate Professor of Occupational and Adult Education; 1982.

LAVAL M. VERHALEN, B.S. (Texas Tech. Univ.), Ph.D. (ibid); Professor of Agronomy; 1977, 1964.

HERLEN S. VISHNIAC, B.A. (Univ. of Michigan), M.A. (Radcliffe College), Ph.D. (Columbia Univ.); Associate Professor of Developmental Psychology; 1980.

JOHN D. VITEK, B.S. (Wisconsin State Univ.), M.A. (Univ. of Iowa), Ph.D. (ibid); Professor of Gynecology and Assistant Dean of the Graduate College; 1984, 1978.

DONALD G. WAGNER, B.S. (Ohio State Univ.), M.S. (Cornell Univ.), Ph.D. (ibid); Regents Professor of Animal Science; 1985, 1965.

JAN WAGNER, B.Ch.E. (Cleveland State Univ.), M.S. (Univ. of Alaska), M.A. (Univ. of Kansas), Ph.D. (ibid); Professor of Biological Engineering; 1985, 1975.


ODELL LARRY WALKER, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Iowa State Univ.); Professor of Agricultural Economics; 1964, 1956.

EDWARD P. WALKIEWICZ, B.A. (Yale Univ.), M.A. (Columbia Univ.), Ph.D. (Univ. of New Mexico); Associate Professor and Interim Head of the Department of English; 1985, 1980.

CLEMENT E. WARD, B.S. (Iowa State Univ.), M.S. (Kansas State Univ.), Ph.D. (ibid); Professor of Agricultural Economics; 1983, 1978.

WILLIAM D. WARDE, B.S. (Univ. of London), M.S. (Florida State Univ.), Ph.D. (Iowa State Univ.); Professor of Statistics; 1994, 1972.

PAUL GEORGE WARREN, A.B. (Baldwin Wallace College), M.A. (Kent State Univ.), Ph.D. (ibid); Professor of Applied Behavioral Studies; 1978, 1970.

LARKIN BRUCE WARNER, A.B. (Ohio Wesleyan Univ.), B.M. (ibid), A.M. (Univ. of Kansas), Ph.D. (ibid); Professor of Economics; 1979, 1967.

MICHAEL M. WARNER, B.A. (Occidental College), M.A. (Univ. of Kansas), Ph.D. (ibid); Associate Professor of Applied Behavioral Studies; 1985, 1982.

THOMAS L. WARREN, A.B. (Univ. of Evansville), M.S. (Indiana Univ.), M.Phil. (Univ. of Kansas), Ph.D. (ibid); Professor of English; 1980, 1977.

ALASTAIR G. WATSON, B.V. (Massey Univ., New Zealand), M.S. (ibid), Ph.D. (Cornell Univ.); Associate Professor of Physiological Science; 1986.

GORDON A. WEAVER, B.A. (Univ. of Wisconsin, Milwaukee), M.A. (Univ. of Illinois), Ph.D. (Univ. of Denver); Professor of Psychology; 1973, 1967.

JAMES WEBSTER, B.S. (Univ. of Kentucky), M.S. (ibid), Ph.D. (Kansas State Univ.); Adjunct Associate Professor of Entomology; 1985, 1982.

DAVID LEE WEEKS, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Professor of Statistics; 1965, 1957.

ROBERT L. WESTERMAN, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Illinois); Regents Professor of Agronomy; 1988, 1976.

PAUL ANTHONY WESTHAUS, B.S. (St Louis Univ.), Ph.D. (Washington Univ.); Professor of Physics; 1976, 1968.

ROBERT PAUL WETTEMANN, B.S. (Univ. of Connecticut), M.S. (Michigan State Univ.), Ph.D. (ibid); Regents Professor of Animal Science; 1985, 1972.

JAMES D. WHITE, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Associate Professor of Agricultural Education; 1985, 1978.

DELBERT L. WHITENACK, B.S. (O.S.U.), D.V.M. (ibid), M.S. (Michigan State Univ.), Ph.D. (ibid); Professor of Veterinary Pathology; 1985, 1972.

RICHARD W. WHITNEY, B.A. (Hiram), Ph.D. (Univ. of North Carolina); Associate Professor of Marketing; 1987, 1983.

LARKIN BRUCE WARNER, A.B. (Ohio Wesleyan Univ.), B.M. (ibid), A.M. (Univ. of Kansas), Ph.D. (ibid); Professor of Economics; 1979, 1967.

MICHAEL M. WARNER, B.A. (Occidental College), M.A. (Univ. of Kansas), Ph.D. (ibid); Associate Professor of Applied Behavioral Studies; 1985, 1982.

THOMAS L. WARREN, A.B. (Univ. of Evansville), M.S. (Indiana Univ.), M.Phil. (Univ. of Kansas), Ph.D. (ibid); Professor of English; 1980, 1977.

JAMES WEBSTER, B.S. (Univ. of Kentucky), M.S. (ibid), Ph.D. (Kansas State Univ.); Adjunct Associate Professor of Entomology; 1985, 1982.

DAVID LEE WEEKS, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Professor of Statistics; 1965, 1957.

ROBERT L. WESTERMAN, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Illinois); Regents Professor of Agronomy; 1988, 1976.

PAUL ANTHONY WESTHAUS, B.S. (St Louis Univ.), Ph.D. (Washington Univ.); Professor of Physics; 1976, 1968.

ROBERT PAUL WETTEMANN, B.S. (Univ. of Connecticut), M.S. (Michigan State Univ.), Ph.D. (ibid); Regents Professor of Animal Science; 1985, 1972.

JAMES D. WHITE, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Associate Professor of Agricultural Education; 1985, 1978.

DELBERT L. WHITENACK, B.S. (O.S.U.), D.V.M. (ibid), M.S. (Michigan State Univ.), Ph.D. (ibid); Professor of Veterinary Pathology; 1985, 1972.

RICHARD W. WHITNEY, B.A. (Hiram), Ph.D. (Univ. of North Carolina); Associate Professor of Marketing; 1987, 1983.
KENNETH EDWARD WIGGINS, B.S. (Troy State Univ., Alabama), M.S. (Auburn Univ.), Ed.D. (ibid); Professor of Curriculum and Instruction and Head of the Department of Aviation and Space Education; 1987, 1962.

JOHN H. WILGUESS, B.S. (Indiana State Univ.), M.S. (ibid), Ph.D. (Univ. of Arkansas); Professor Emeritus of Accounting; 1982, 1979.

JERRY LEO WILHM, B.S. (Kansas State M.S. (ibid), Ph.D. (Univ. of Illinois, Urbana); Regents Professor of Biochemistry; 1985, 1981.

JOSEPH E. WILLIAMS, B.S. (New Mexico State Teachers College), M.S. (ibid), Ph.D. (O.S.U.); Professor and Head of the Department of Zoology; 1982, 1986.


LINDA J. WILLSON, B.S. (West Texas State Univ.), M.S. (ibid), Ph.D. (O.S.U.); Associate Professor of Statistics; 1985, 1981.

BRUCE N. WILSON, B.S.A.E. (Univ. of Minnesota), M.S.A.E. (ibid), Ph.D. (Univ. of Kentucky); Associate Professor of Agricultural Engineering; 1987, 1983.

TIMOTHY MICHAEL WILSON, B.S. (Univ. of Florida), Ph.D.(ibid); Professor of Physics; 1982, 1969.

ROBERT F. WITTWER, B.S. (State Univ. of New York), M.S. (ibid), Ph.D. (ibid); Associate Professor of Forestry; 1982.

HARRY S. WOHLERT, B.S. (O.S.U.), M.S. (Univ. of Oklahoma), Ed.D. (O.S.U.); Professor of Foreign Languages and Literatures; 1987, 1967.

JOHN E. WOLFE, B.A. (Bucknell Univ.), M.A. (Univ. of California), M.P.A. (ibid), Ph.D. (ibid); Associate Professor of Mathematics; 1978, 1974.

MIKE D. WOODS, B.S. (Arkansas Tech Univ.), M.S. (Univ. of Arkansas), Ph.D. (O.S.U.); Associate Professor of Agricultural Economics; 1986.


CHARLOTTE J. WRIGHT, B.B.A. (Univ. of Texas, Arlington), M.P.A. (ibid), Ph.D. (North Texas State Univ.); Associate Professor of Accounting; 1982.

RUSSELL E. WRIGHT, B.S. (Iowa State Univ.), M.S. (ibid), Ph.D. (Univ. of Wisconsin); Professor and Interim Head of the Department of Entomology; 1982, 1976.

RADA K. RAO VARLAGADDA, B.E. (Univ. of Mysore), M.S. (South Dakota State Univ.), Ph.D. (Michigan State Univ.); P.E.; Regents Professor of Electrical and Computer Engineering; 1987, 1966.


CLIFFORD E. YOUNG, III, B.S. (Colorado State Univ.), M.B.A. (Univ. of Utah), Ph.D. (ibid); Associate Professor of Marketing; 1985, 1980.
CLAYTON BLAKE MILLINGTON, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Michigan State University); Professor Emeritus of Administrative Services and Business Education; 1969, 1960.

JOHN MILSTEAD, B.A. (Univ. of New Mexico), M.A. (Univ. of Iowa), Ph.D. (Univ. of Wisconsin); Professor Emeritus of Engineering; 1966, 1947.


V. BROWN MONNETT, B.S. (Univ. of Oklahoma), Ph.D. (Univ. of Michigan); Professor Emeritus of Geology and Associate Dean Emeritus of the College of Arts and Sciences; 1980, 1947.

GEORGE AZRO MOORE, B.S. (O.S.U.), M.S. (Univ. of Oklahoma), Ph.D. (Univ. of Michigan); Professor Emeritus of Zoology; 1965, 1931.

THOMAS EDWIN MOORE, B.A. (Univ. of Texas), M.A. (ibid), Ph.D. (ibid); Professor Emeritus of Chemistry 1982, 1947.

CLAYTON A. MORGAN, B.A. (Millsaps College), M.Ed. (Univ. of Texas), Ed.D. (ibid); Professor Emeritus of Psychology; 1984, 1958.


TED RICHARD NELSON, B.S. (Univ. of Nebraska), M.S. (ibid), Ph.D. (O.S.U.); Professor Emeritus of Agricultural Economics; 1987, 1965.

WILBUR STANLEY NEWCOMER, B.S. (Pennsylvania State Univ.), M.S. (Cornell Univ.), Ph.D. (ibid); Professor Emeritus of Physics; 1965, 1950.

JOSEPH RANDOLPH NORTON, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Texas); Professor Emeritus of General Engineering; 1978, 1946.


HAROLD CECIL OLSON, B.S. (South Dakota College), M.S. (West Virginia Univ.), Ph.D. (Iowa State Univ.); Professor Emeritus of Dairy Science; 1971, 1940.

ALEXANDER MEIR OSPOW, B.S. (Univ. of Oklahoma), M.A. (ibid), Ph.D. (ibid); Professor Emeritus of History; 1988, 1962.


JAMES VERNON PARCHE, B.S. (O.S.U.), M.S. (ibid), A.M. (Harvard), Ph.D. (Univ. of Arkansas); PE; Professor Emeritus of Civil Engineering; 1985, 1947.


JAMES M. PAYNE, B.S. (Clemson College), M.S. (ibid), Ph.D. (Univ. of Minnesota); Professor Emeritus of Agricultural Economics; 1988, 1955.

HAROLD JACKSON POLK, B.A. (San Jose State College), M.A. (ibid), Ed.D. (Univ. of Missouri); Associate Professor Emeritus of Industrial Arts Education; 1986, 1959.

JAY O. PORTERFIELD, B.S. (Iowa State Univ.), M.S. (ibid), Ph.D. (ibid); Professor Emeritus of Psychology; 1982, 1952.


LESTER WINFIELD REED, B.S. (O.S.U.), M.S. (ibid), Ph.D.(Univ. of Missouri); Professor Emeritus of Economics; 1983, 1947.

ROBERT MCLEOD REED, B.S. (Univ. of Illinois), M.S. (ibid), Ph.D. (ibid); Professor Emeritus of Agronomy; 1987, 1950.

CLIFFORD ARTHUR LEROY RICH, B.F.S. (Univ. of Southern California), M.A. (ibid), Ph.D. (Iowa State Univ.); Professor Emeritus of Political Science; 1984, 1953.

DONALD W. ROBINSON, A.B. (Carthage College, MA. (Bradley Univ.), Ph.D. (ibid); Professor Emeritus of Psychology and Educational Administration and Higher Education, Dean Emeritus of the College of Education, and Director Emeritus of Teacher Education; 1988, 1972.

LAWRENCE O. ROTH, B.S. (Univ. of Wisconsin), M.S. (O.S.U.), Ph.D. (ibid); P.E.; Professor Emeritus of Agricultural Engineering; 1987, 1942.

ROScoe ROUSE, B.A. (Univ. of Oklahoma), M.A. (Univ of Michigan), Ph.D. (ibid); Librarian Emeritus of the Edmon Low Library; 1987, 1967.

F. CUTHBERT SALMON, B.Arch. (Univ. of Pennsylvania), M.Arch. (ibid), R.A.; NCARB; Professor Emeritus of Architecture; 1980, 1959.


ERVIN WILLIAM SCHROEDER, B.S. in Ag.E. (Univ. of Wisconsin), M.E. (ibid), M.S. Pennsylvania State Univ.); PE; Professor Emeritus of Agricultural Engineering; 1974, 1947.


ANSEL MIREE SHARP, B.S. (Howard College), M.A. (Univ. of Virginia), Ph.D. (Louisiana State Univ.); Professor Emeritus of Economics; 1985, 1957.


LEONARD FRANCIS SHEARER, B.S. (Alfred Univ.), M.S. (Ohio State Univ.), Professional Engineering Degree (Alfred Univ.); P.E.; Professor Emeritus of Chemical Engineering and Executive Director of Engineering and Industrial Extension; 1966, 1931.


HELMER ELLSWORTH SORENSEN, B.E. (Eau Claire State Teachers College), Ph.M. (Univ. of Wisconsin), Ph.D. (ibid); Professor Emeritus of Education and Dean Emeritus of the College of Education; 1973, 1949.


NYHAYAPATHI V.V.J. SWAMY, B.S. (Siddarth College), M.S. (ibid), Ph.D. (Florida State Univ.): Professor Emeritus of Physics; 1987, 1968.


RUDOLPH W. TRENTON, Dr. of Law (Univ. of Rome), Dr. of Political Science (Univ. of Turin, Italy): Professor Emeritus of Economics; 1980, 1962.


LOUIS P. VARGA, B.A. (Reed College), M.S. (Univ. of Chicago): Associate Professor Emeritus of Chemistry; 1986, 1961.


JAMES ELIAS WEBSTER, B.S. (Ohio State Univ.), Ph.D. (ibid): Professor Emeritus of Biochemistry; 1968, 1927.

DALE ELDON WIEBEL, B.S. (Univ. of Nebraska), M.S. (ibid), Ph.D. (Iowa State Univ.): Professor Emeritus of Agronomy; 1986, 1958.


HARRY C. YOUNG, JR., B.S. (Ohio State Univ.), M.S. (Univ. of Minnesota), Ph.D. (ibid): Professor Emeritus of Plant Pathology; 1956, 1950.


Associate Members

EARL PIERCE AALSETH, JR., B.S. (Montana State Univ.), M.S. (Iowa State Univ.), Ph.D. (Virginia Polytechnic): Assistant Professor of Animal Science; 1981.

MARIAN F. ABBOTT, B.M.E. (Central Methodist College), M.M. (Wichita State Univ.): Associate Professor of Music; 1970.

CHRISTOPHER MITCHEL ADAMS: B.S. (Univ. of California, Los Angeles), M.S. (Univ. of Wyoming), Ph.D. (Univ. of Nevada, Reno): Assistant Professor of Chemistry; 1987.

MARSHALL E. ALLEN, B.A. (Miami Univ.): M.A. (ibid): Associate Professor of Journalism and Broadcasting and Director of Educational Television Services; 1967.


JAMES HOWARD BARNETT: B.S. (Oregon College), M.Ed. (Colorado State Univ.): Professor Emeritus of Agricultural Economics; 1981.

ERIC NEIL ANGEVINE, B.S. (Univ of Texas at Austin), As. (ibid): Associate Professor of Architecture; 1985.


JAMES E. BAKER, B.S. (U.S. Naval Academy), B.S.E.E. (O.S.U.), M.S.E.E. (ibid), Ph.D. (ibid): Professor and Head of the School of Electrical and Computer Engineering; 1986.

CHARLES B. BAIN, B.S. (Univ. of Massachusetts), D.V.M. (Cornell Univ.), M.S. (ibid), Ph.D. (ibid): Assistant Professor of Physiology; 1985.

WILLIAM L. BALLENGER, B.A. (Univ. of Iowa), M.A. (Northeast Missouri State Univ.): Associate Professor of Music; 1987.

DONNA KAY BANDY, B.A. (Univ. of Iowa), M.A. (Drexel Univ.), Ph.D. (ibid): Assistant Professor of Physics; 1987.


KENNETH E. BARTELS, M.S. (Colorado State Univ.), D.V.M. (Iowa State Univ.): Associate Professor of Veterinary Medicine and Surgery; 1984, 1982.


D. J. BAYLES, B.M.E. (Univ. of Oklahoma): M.S.M.E.(ibid), Ph.D. (O.S.U.): Associate Professor in the School of Technology; 1979, 1974.


JAY M. BEEBY, B.S. (Phillips Univ.): M.A. (Univ. of Illinois): Assistant Professor of Speech and Language Pathology and Audiology; 1974.

RONALD M. BEER, B.S. (Illinois State Univ.), M.A. (Michigan State Univ.), Ph.D. (Kent State Univ.): Professor of Educational Administration and Higher Education and Vice-President of Student Services; 1980.

PATRICIA A. BELL, B.S. (O.S.U.), M.S. (ibid), Ph.D.(Univ. of Texas): Assistant Professor of Sociology; 1987, 1981.

CAROL L. BENDER, B.S. (Texas Tech Univ.), M.S. (Oregon State Univ.), Ph.D. (Univ. of California, Riverside): Assistant Professor of Plant Pathology; 1986.

DANIEL J. BERNARDO, B.S. (Univ. of California, Davis), Ph.D. (Washington State Univ.): Assistant Professor of Agricultural Economics; 1985.


DAVID M. BILLBAX, B.S.Ed. (Illinois State Univ.): M.A. (Univ. of Kansas), MPhil. (ibid), Ph.D. (ibid): Assistant Professor of Political Science; 1988, 1976.

BIRNE BINEGAR, B.S. (Univ. of California, Los Angeles), M.S. (ibid), Ph.D. (ibid): Assistant Professor of Mathematics; 1988.

JOHN PAUL BISCHOFF, B.A. (Univ. of Maryland), Ph.D. (Yale Univ.): Assistant Professor of History; 1984, 1976.

GEORGE BAKER BOKORNEY, B.S. (ibid), M.S. (ibid), Ph.D. (ibid): Assistant Professor of Veterinary Medicine and Surgery; 1983, 1971.

MARY S. BROSEK, A.B. (Sweet Briar College), Ph.D. (Univ. of Florida): Assistant Professor of Finance; 1985.
GLENN OWEN BROWN, B.S. (Arizona State Univ.), M.S. (Colorado State Univ.), Ph.D. (ibid); Assistant Professor of Agricultural Engineering; 1987.

L. HERBERT BRUNEAU, B.S.(McGill Univ.), M.A. (Univ. of Texas), Ph.D. (ibid); Professor of Zoology and Program Director of Natural Sciences.

JOHN H. BRYANT, B.Arch. (O.S.U.), M.Arch, (Univ. of Illinois); A.I.A.; NCARB Certified; Professor of Architecture; 1977.

DAVID KIM BURNHAM, B.S. (Brigham Young Univ.), M.S. (ibid), Ph.D. (Univ. of Texas Health Sciences Center, Dallas); Assistant Professor of Botany and Microbiology; 1988.

MARILYN M. BURNS, B.S. (Univ. of Colorado, Boulder), M.A. (Univ. of Northern Colorado, Greeley), Ph.D. (O.S.U.); Associate Professor of Clothing, Textiles and Merchandising.

LOWELL M. BUSMAN, B.S. (Southwest State Univ. Minnesota), M.S. (Univ. of Minnesota), Ph.D. (Iowa State Univ.); Assistant Professor of Agronomy; 1987.

CHARLES M. BYLES, B.S. (Univ. of the West Indies), M.B.A. (Univ. of Toledo), D.B.A. (Kent State Univ.); Assistant Professor of Management; 1987.

MARGARET S. CALLSEN, B.A. (Concordia College), M.S. (Univ. of Wisconsin), Ph.D. (Kansas State Univ.); Associate Professor and Interim Head of the Department of Home Economics Education and Community Services; 1977, 1973.


VIRGIL R. CARTER, B.Arch, (O.S.U.), M.Arch. (Univ. of Illinois at Urbana-Champaign); Professor and Head of the School of Architecture; 1986.

JOHN W. CARTINOUR, B.A. (Univ. of Arkansas, Little Rock), M.S. (O.S.U.), Ph.D. (ibid), Assistant Professor of Electrical and Computer Engineering; 1987.

ROBERT CARTWRIGHT, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Virginia Tech.); Assistant Professor of Entomology; 1987.

CHRISTINE M. CASHEL, B.S. (Russell Sage College), M.S. (M.S.C.E. (ibid), Ph.D. (ibid), Assistant Professor of Agricultural Engineering; 1984.

CHARLES ROBERT DAVIS, B.S. (Univ. of Oklahoma), M.Ed. (ibid), Ph.D. (ibid); Associate Professor of Veterinary Pathology; 1986.
J. MACK OYLER, D.V.M. (O.S.U.), Ph.D. (ibid); Professor of Veterinary Medicine and Surgery and Associate Dean of Student Affairs of the College of Veterinary Medicine; 1980, 1974.

DAVID W. PARK, B.S. (Brigham Young Univ.), M.B.A. (ibid), Ph.D. (Cornell Univ.); Assistant Professor of Agricultural Economics; 1985.

PHILIP E. PAULIN, B.A. (Univ. of Kentucky), M.A. (ibid), Ed.D. (O.S.U.); Professor of Journalism and Broadcasting; 1987, 1971.

ETTA L. PERKINS, B.A. (Univ. of Oklahoma), M.A. (Indiana Univ.), Ph.D. (ibid); Assistant Professor of History; 1984, 1983.

KATYE M. PERRY, B.S. (Bishop College), Ph.D. (Univ. of Utah); Professor of Health, Physical Education and Leisure and Coordinator, Health; 1979, 1974.

RICHARD CARLTON ROHRS, B.A. (Bucknell Univ.), M.A. (Univ. of Nebraska), Ph.D. (ibid); Associate Professor of History; 1982, 1976.

LOREN ROMMANN, B.S. (South Dakota State Univ.), Ph.D. (ibid); Professor and Extension Specialist of Agronomy; 1979, 1970.

WILLIAM JAMES RUGG, B.A. (Barrington College), M.S. (Utah State Univ.), Ph.D. (ibid); Assistant Professor of Agricultural Economics; 1985.

LARRY D. SANDERS, B.A. (Chapman College), M.S. (New Mexico State Univ.), Ph.D. (Colorado State Univ.); Assistant Professor of Agricultural Economics; 1985.

RAY E. SANDERS, B.S.O.S. (M.S.), Ed.D. (ibid); Assistant Professor of Occupational and Adult Education; 1988, 1985.

ANDREAS SAVVIDES, B.S./B.Com. (Univ. of Birmingham U.K.), M.A. (Univ. of Florida), Ph.D. (ibid); Assistant Professor of Economics; 1986, 1985.

GEORGE M. SCHAEFFER, B.S. (U.S. Military Academy), M.S. (Kansas State Univ.), Ph.D. (ibid); Assistant Professor of Electrical and Computer Engineering; 1987.

DOROTHY L. SCHRAIDER, B.A. (Agnes Scott College), M.A. (Middlebury College), Ph.D. (Florida State University); Licence-lettres, (Univ. de Paris III); Associate Professor of Foreign Languages and Literatures; 1982, 1977.

MARGARET M. SCOTT, B.A. (Univ. of Northern Colorado), M.A. (New Mexico State Univ.), Assistant Professor of Curriculum and Instruction; 1987.

WALTER GAYLORD SCOTT, B.A. (Baylor Univ.), B.D. (Southwestern Baptist Theological Seminary), Th.M. (ibid), M.A. (Baylor Univ.), Ph.D. (Johns Hopkins Univ.); Associate Professor of Philosophy; 1970, 1960.

LOUIS SEIG, B.A. (Louisiana State Univ.); M.A. (ibid), Ph.D. (Univ. of Minnesota); Assistant Professor of Animal Science; 1986.


JAMES R. SHOLAR, B.S. (Univ. of Tennessee, Martin), M.S. (O.S.U.), Ph.D. (ibid); Associate Professor of Agronomy; 1987.

PETER OTTO SHULL, Jr., A.B. (Princeton Univ.), M.S. (Rice Univ.), Ph.D. (ibid); Assistant Professor of Physics; 1984.

PHILLIP L. SIMS, B.S.O.S. (M.S.), Ph.D. (Utah State Univ.); Adjunct Associate Professor of Agronomy; 1977.

STEVEN H. SLUSHER, B.S. (Kansas State Univ.), M.S.O.S. (O.S.U.), D.V.M. (Kansas State Univ.); Assistant Professor of Veterinary Medicine and Surgery; 1985, 1978.

H. GENE SMITH, B.S.O.S. (M.S.), M.B.A. (ibid), Ed.D. (ibid); Associate Professor of Occupational and Adult Education; 1983, 1971.

MICHAEL MYRLE SMITH, B.A. (Southern Illinois Univ.), M.A. (ibid), Ph.D. (Texas Christian Univ.); Associate Professor of Sociology; 1976.

LEON J. SPICER, B.S. (Univ. of Minnesota), M.S. (Univ. of Idaho), Ph.D. (Michigan State Univ.); Assistant Professor of Animal Science; 1988.

STEPHEN JOHN STADLER, B.S.Ed. (Miami Univ.), M.A. (ibid), Ph.D. (Indiana Univ.); Associate Professor of Geography; 1986, 1980.

MICHAEL EDWARD STANO, B.A. (Univ. of Nevada, Reno), M.A. (Univ. of Colorado), Ph.D. (Univ. of Minnesota); Associate Professor of Speech Communication; 1982, 1977.

GREGORY STEFIAK, B.S. (Southern Illinois Univ.), M.S. (Brooklyn College), Ph.D. (Southern Illinois Univ.); Assistant Professor of Journalism and Broadcasting; 1982.


A. KENNETH STERN, B.A. (Messiah College), M.Ed. (Shippensburg State College), Ed.D. (Univ. of Oklahoma); Assistant Professor of Educational Administration and Higher Education; 1985, 1980.

GARY R. STEVENS, B.S. (Northern Illinois Univ.); M.S. (ibid), Ph.D. (Texas A&M Univ.); Assistant Professor of Statistics; 1986.

JANICE RAE STEWART, B.S. (Kansas State Univ.), M.S. (ibid), Ph.D. (ibid); Assistant Professor of Food, Nutrition and Institution Administration; 1980.


JAMES H. STINE, B.A. (O.S.U.), M.S. (ibid); Associate Professor of Geography; 1976, 1967.

MARVIN L. STONE, B.S. (Colorado State Univ.); M.S. (ibid), Ph.D. (Washington State University); Associate Professor of Agricultural Engineering; 1986, 1982.

LOUIE G. STRATTON, D.V.M. (O.S.U.), Ph.D. (ibid); Assistant Dean of the College of Veterinary Medicine Outreach; 1987, 1973.

DOROTHY STROM, B.S. (State Univ. of New York, College at Plattsburgh), M.S. (Univ. of Wisconsin-Superior); Ph.D. (Ball State Univ.); Assistant Professor of Applied Behavioral Studies; 1988.

TANA WOOD STUFFLEBEAN, B.S. (O.S.U.), M.E. (Central State Univ.), Ph.D. (O.S.U.); Assistant Professor of Clothing, Textiles and Merchandising; 1980, 1979.

E. H. SUTTON, B.S. (Southwestern Missouri State Univ.), M.S. (St. Louis University); Ph.D. (Univ. of Illinois); Assistant Professor of Management; 1987.

JOHN ANDREW SYLVESTER, A.B. (Harvard Univ.), M.A. (Univ. of Wisconsin), Ph.D. (ibid); Associate Professor of History; 1970, 1966.

MICHAEL REED TAYLOR, B.S.E. (Bowling Green State Univ.), M.A. (ibid), Ph.D. (Florida State Univ.); Assistant Professor of Philosophy; 1984.

KEITH A. TEAGUE, B.S.E.E. (O.S.U.), M.S.E.E. (ibid), Ph.D. (ibid); Associate Professor of Electrical and Computer Engineering; 1988, 1983.

JAMES STEEL THAYER, B.A. (Indiana Univ.); M.A. (ibid), M.T.S. (Harvard Univ.), Ph.D. (University of Michigan); Associate Professor of Religious Studies; 1985, 1981.

DAVID G. THOMAS, B.A. (Albion College), M.A. (Univ. of Denver); Ph.D. (ibid); Assistant Professor of Psychology; 1985.

MICHAEL F. THOMAS, B.S.B.A. (San Jose State Univ.), M.B.A. (ibid), Ph.D. (Univ. of Wisconsin); Assistant Professor of Accounting; 1985.
John W. Thornton, B.S. (O.S.U.), Ph.D. (Univ. of Washington); Professor of Zoology; 1974, 1960.

Donald R. Topliff, B.S. (Kansas State Univ.), M.S. (Texas A & M Univ.), Ph.D. (ibid); Associate Professor of Animal Science; 1988, 1983.

William Bryan Tucker, B.S. (Mississippi State Univ.), M.S. (ibid), Ph.D. (Univ. of Kentucky); Assistant Professor of Animal Science; 1988.

Gwendolyn Y. Turner, B.A. (Arkansas State Univ.), M.Ed. (Univ. of Arkansas), Ed.D. (ibid); Assistant Professor of Curriculum and Instruction; 1988.

Stephen W. Tweedie, B.S. (Cornell Univ.), M.Ed. (ibid), Ph.D. (Syracuse Univ.); Associate Professor of Geography; 1976, 1971.

Moses N. Vijayakumar, B.S. (Univ. of Madras, India), M.S. (ibid), M.S. (Univ. of Illinois, Chicago), Ph.D. (ibid); Assistant Professor of Microbiology; 1988.

Franz A. Von Sauker, A.B. (Univ. of Kansas), M.A. (ibid), Ph.D. (Georgetown Univ.); Associate Professor of Political Science; 1975, 1968.

Ibrahim A. Waheed, B.S. (Damasacus Univ.), M.S. (Ohio State Univ.), Ph.D. (ibid); Assistant Professor of Food, Nutrition and Institution Administration; 1987.

Martin Wallen, B.A. (Linfield College), M.A. (Vanderbilt), Ph.D. (ibid); Assistant Professor of English; 1987.

David Steven Webster, B.A. (Brandeis Univ.), M.A. (Univ. of Chicago), Ph.D. (Univ. of California, Los Angeles); Assistant Professor of Educational Administration and Higher Education; 1987.

B. Peter Westerhoff, B.A. (Wittenburg (Ohio) Univ.), M.F.A. (Univ. of Connecticut); Assistant Professor of Theater; 1986, 1985.

Joseph W. Westphal, B.A. (Adelphi Univ.), M.A. (O.S.U.), Ph.D. (Univ. of Missouri); Associate Professor Political Science; 1984, 1975.

Thomas S. Wetzell, B.S. (Northern Illinois Univ.), M.B.A. (ibid), Ph.D. (O.S.U.); Assistant Professor of Accounting; 1986.

Margaret A. White, B.S. (Sam Houston State Univ.), M.B.A. (ibid), Ph.D. (Texas A&M College Station); Assistant Professor of Management; 1983.

Samuel Whititt, B.A. (American Univ. of Beirut), M.A. (Sangamon State Univ.), Ph.D. (State Univ. of New York, Buffalo); Assistant Professor of English; 1988.

Elizabeth J. Whitt, B.A. (Drake Univ.), M.A. (Michigan State Univ.), Ph.D. (Indiana Univ.); Assistant Professor of Educational Administration and Higher Education; 1988.

Robert C. Wicklein, B.S. (Western Kentucky Univ.), M.S. (Univ. of Alabama, Birmingham), Ed.D. (Virginia Polytechnic Institute and State Univ.); Assistant Professor of Occupational and Adult Education; 1986.

James P. Wicksted, B.A. (New York Univ.), M.A. (City College of New York), Ph.D. (ibid); Assistant Professor of Philosophy; 1985.

Elizabeth A. Williams, B.A. (Univ. of Oklahoma), M.A. (Univ. of Oregon), Ph.D. (Indiana Univ.); Assistant Professor of History; 1986.

Ervin Williams, Jr., B.S. (Kansas State Univ.), M.S. (ibid), Ph.D. (O.S.U.); Associate Professor of Plant Pathology; 1979, 1969.

Janice Williams, B.S. (Frostburg State Univ.), M.P.A. (California State Univ.), Ph.D. (Univ. of California, Los Angeles); Assistant Professor of Applied Behavioral Studies; 1988.

William James Willis, III, B.A. (Univ. of Oklahoma), M.A. (East Texas State Univ.), Ph.D. (Univ. of Massachusetts); Associate Professor of Journalism and Broadcasting; 1988.

Elaine Wilson, B.S. (Univ. of Southwestern Louisiana), M.S. (Univ. of Alabama), Ph.D. (O.S.U.); Associate Professor of Family Relations and Child Development; 1988, 1973.

John R. Wingender, B.A. (Univ. of Nebraska), M.A. (ibid), Ph.D. (ibid); Assistant Professor of Finance; 1985.

Pauline Winter, B.S. (Texas Woman's Univ.), M.A. (ibid); Associate Professor of Health, Physical Education and Leisure; 1970, 1965.


David J. Wright, A.B. (Cornell Univ.), A.M. (Harvard Univ.), Ph.D. (ibid); Assistant Professor of Mathematics; 1985.

John H. Wycoff, III, B.S. (Univ. of Florida), Ph.D. (ibid); Assistant Professor of Veterinary Parasitology, Microbiology, & Public Health; 1986.

Lawrence D. Yates, B.S. (Texas A & M Univ.), M.S. (ibid), Ph.D. (Univ. of Washington); Assistant Professor of Animal Science; 1988.

Alexander V. Zale, B.S. (Univ. of Massachusetts), M.S. (Virginia Polytechnic Institute & State Univ.), Ph.D. (Univ. of Florida); Adjunct Assistant Professor of Zoology; 1985.

Michael Tarrant Zavy, B.S. (Cornell Univ.), M.S. (Univ. of Florida), Ph.D. (ibid); Assistant Professor of Animal Science; 1983.

Roger Zierau, B.S. (Trinity College), Ph.D. (Univ. of California, Berkeley); Assistant Professor of Mathematics; 1988.

Peter Zuber, B.S. (Univ. of Maine), Ph.D. (Univ. of Virginia); Assistant Professor of Microbiology; 1986.

Farrel J. Zwerneman, B.S.C.E. (Univ. of Texas), M.S.C.E. (ibid), Ph.D. (ibid); Assistant Professor of Civil Engineering; 1985.

Associate Members Emeriti


Armond Dudley Barefoot, B.S. (O.S.U.), M.S. (ibid); Associate Professor Emeritus of Agricultural Engineering; 1986, 1953.

Paul B. Barto, D.V.M. (Univ. of Pennsylvania), M.S. (Oregon State Univ.), Ph.D. (ibid); Professor Emeritus of Veterinary Parasitology, Microbiology and Public Health; 1986, 1955.

George W. Baumiller, Diploma in Interior Architecture (State C. of Building, Warsaw Poland) M.S. (Warsaw Inst. of Technology); Associate Professor Emeritus of Architecture; 1968, 1972.

Friedrich M. Black, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Business and Administration; 1982, 1972.

John Richard Bosworth, B.A. (Univ. of Illinois), M.A. (ibid); Assistant Professor Emeritus of Philosophy; 1986, 1962.

Wendell Bowers, B.S. (Univ. of Illinois), M.S. (ibid); Professor Emeritus of Agricultural Engineering; 1985, 1987.

Julian H. Bradsher, A.B. (Univ. of South Carolina), M.A. (Univ. of Colorado), Ph.D. (Univ. of California); Professor Emeritus of Economics; 1977, 1948.

Ralph A. Brann, B.S. (Bethel College), M.S. (O.S.U.), Ed.D. (ibid); Professor Emeritus of Educational Administration and Higher Education; 1979, 1964.

Charlie A. Burns, B.S. (O.S.U.), M.S. (ibid), Ed.D. (ibid); Professor Emeritus of Agricultural Education; 1985, 1953.


Raymond E. Chapel, B.S. (O.S.U.), M.S. (ibid); Professor Emeritus of Mechanical and Aerospace Engineering and Director Emeritus of Engineering Research and Development; 1975, 1944.

Geoffrey Philip Collins, B.S.A. (Univ. of Toronto), M.S. (Univ. of Illinois); Professor Emeritus of Agricultural Economics; 1970, 1939.

Hylda S. Converse, B.A. (Smith College), B.D. (Union Theological Seminary); Ph.D. (Columbia Univ.); Professor Emeritus of Religious Studies; 1986, 1968.

George Earl Cook, B.S. (O.S.U.), M.S. (ibid); Associate Professor Emeritus of Agricultural Engineering; 1986, 1952.

Frank Francis Davies, B.S. (O.S.U.), M.S. (ibid); Associate Professor Emeritus of Agronomy; 1971, 1937.


William Clifford Elder, B.S. (O.S.U.), M.S. (ibid); Associate Professor Emeritus of Agronomy; 1968, 1933.


Mary L. Frye, B.A. (Univ. of Hamline), M.S. (O.S.U.), Ed. D (ibid); Assistant Professor Emeritus of Health, Physical Education and Recreation; 1988, 1968.

J. Lloyd Garner, B.S. (East Central State College, Oklahoma), Ed.M. (Univ. of Oklahoma); Associate Professor Emeritus of Business Education and Office Management; 1976, 1942.

Gordon Brazil Gilbert, B.A. (Ouachita College), M.A. (George Peabody College for Teachers); Associate Professor Emeritus of Health, Physical Education and Recreation; 1973, 1940.

LEMOU D. GROOM, B.A. (Univ. of Oklahoma), M.S. (O.S.U.); Associate Professor Emeritus of Journalism and Broadcasting; 1977, 1946.

WERNER GRUNINGER, B.A. (Univ. of British Columbia), M.A. (Duke Univ.), Ph.D. (Univ. of Washington); Professor Emeritus of Sociology; 1985, 1974.


JOHN EDWARD HOFFMAN, B.S. (Univ. of Oklahoma), M.A. (ibid); Associate Professor Emeritus of Mathematics; 1987, 1956.


JAMES A. JACKSON, B.A. (Southwestern College), M.S. (O.S.U.), Ph.D. (ibid); Assistant Professor Emeritus of Veterinary Parasitology, Microbiology and Public Health; 1986, 1968.


WILLIAM M. KINCAID, B.S. (Univ. of Colorado), M.S. (ibid), Ph.D. (Univ. of Texas); Professor Emeritus of Marketing; 1986, 1969.

FRED LECRONE, B.S. (O.S.U.), M.S. (Iowa State Univ.); Associate Professor Emeritus of Horticulture and Assistant Dean Emeritus of Resident Instruction in Agriculture; 1973, 1939.

MARY E. LEIDIGH, B.S. (Texas Technological College), M.S. (Univ. of Texas); Professor Emeritus of Food, Nutrition and Institution Administration; 1977, 1945.

GEORGE W. A. MAHONEY, B.S. (Univ. of Illinois), M.S. (O.S.U.) Ph.D. (ibid); Associate Professor Emeritus of Agricultural Engineering; 1986, 1949.

SARA DORIS MEADOR, B.S. (Texas State College for Women), M.S. (Iowa State Univ.); Associate Professor Emeritus of Clothing, Textiles and Merchandising; 1971, 1939.


LOU S. MORRISON, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Plant Pathology; 1971, 1948.


JOHN DAVIS NABFF, B.S. (Univ. of Alabama), M.S. (ibid), Ph.D. (Univ. of Kansas); Professor Emeritus of Geology; 1981, 1949.


FAYNE H. OBERST, D.V.M. (Kansas State Univ.), M.S. (Cornell Univ.), Diplomate (The American College Theriogenologists Specialty Board in Veterinary Medicine); Professor Emeritus of Veterinary Medicine and Surgery; 1984, 1974.

DUANE RUSSELL PETERSON, D.V.M. (Kansas State Univ.), M.S. (ibid); Professor Emeritus of Physiological Science; 1986, 1948.


DELBERT LEROY RUTLEDGE, B.S. (Univ. of New Mexico), M.S. (O.S.U.), Ed.D. (ibid); Professor Emeritus of Physics; 1986, 1957.

DAVID ADOLF SANDER, B.S. (Univ. of Nebraska), M.S. (ibid), Ph.D. (Purdue Univ.); Professor Emeritus of Agronomy; 1982, 1957.


DOROTHY SAVILLE, B.S. (Univ. of Missouri), M.S. (Kansas State Univ.); Professor Emeritus of Clothing, Textiles and Merchandising; 1971, 1937.


JOHN LOUIS SCHWEITZER, B.F.A. (Univ. of Arizona), M.A. (ibid), M.A. (Univ. of Michigan); Associate Professor Emeritus of Foreign Languages and Literatures; 1984, 1959.

MARJORIE M. SCHWEITZER, B.A. (Univ. of Colorado), M.A. (Univ. of Arizona), Ph.D. (Univ. of Oklahoma); Assistant Professor Emeritus of Sociology; 1986, 1982.


CHARLES L. SMITH, B.M. (Central Methodist College), M.A. (Univ. of Colorado), M.A. (Univ. of Northern Colorado), Ed.D. (ibid); Associate Professor Emeritus of Curriculum and Instruction; 1986, 1972.

GORDON C. SMITH, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Industrial Engineering and Management; 1976, 1967.


WALTER L. STARKS, B.S. (O.S.U.), M.S. (ibid), Ed.D. (ibid); Assistant Professor Emeritus of Administrative Services and Business Education; 1988, 1966.

HOBART E. STOCKING, B.A. (Johns Hopkins Univ.), Ph.D. (Univ. of Chicago); Professor Emeritus of Geology; 1972, 1959.

FRANCES L. STROMBERG, B.A. (O.S.U.), M.S. (ibid), Ph.D. (Florida State Univ.); Professor and Head Emeritus of the Department of Family Relations and Child Development; 1986, 1967.

ROY V. STURGEON, JR., B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Minnesota); Professor Emeritus of Plant Pathology; 1986, 1961.

JOHN BRUCE TATE, B.S. (O.S.U.), M.S. (ibid), Ed.D. (Texas A & M Univ.); Associate Professor of Industrial Arts Education; 1971, 1947.

WARREN E. TAYLOR, B.S. (O.S.U.), M.S. (ibid); Associate Professor Emeritus of Agricultural Engineering; 1981, 1952.

HOUSTON EVERETT WARD, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Professor Emeritus of Agricultural Economics; 1977, 1935.

DAN WESLEY, B.A. (Berea College), M.S. (Boston Univ.) M.A. (George Peabody College for Teachers), Ph.D. (O.S.U.); Professor Emeritus of Sociology and Director Emeritus of Arts and Sciences Student Services; 1984, 1960.

ARLO R. WHITE, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Agricultural Education; 1988, 1938.

ERIC IDWAY WILLIAMS, M.R.C.V.S. (Royal Veterinary College), F.R.C.V.S. (Royal College of Veterinary Surgeons), M.S. (O.S.U.); Professor Emeritus of Veterinary Medicine and Surgery; 1988, 1961.

VICTOR WOLFRAM, B.S. (Juilliard School of Music), M.S. (ibid); Professor Emeritus of Music; 1982, 1960.

WILLIAM ROSE WRAY, B.A. (Yale College), M.A. (Yale Univ.), Ph.D. (ibid); Associate Professor Emeritus of English; 1981, 1966.
### Course Listings

Contains course descriptions listed alphabetically by fields (See the College of Osteopathic Medicine of OSU College Catalog for osteopathic medicine course descriptions.)

---

**Explanation of Course Listings**

A course listing is comprised of the following elements, in order:

- **Course Number.** All courses are identified by numbers composed of four digits. The first digit indicates the class year in which the subject is ordinarily taken, although enrollment is not exclusive as to student classification, the second and third digits identify the course within the field and the last digit identifies the number of semester credit hours the course carries. A course number beginning with 0 indicates that the course does not carry University credit. A course number ending in 0 indicates that the course carries variable credit. An asterisk (*) following the four-digit number indicates the course is approved for graduate credit.

- Those numbered 5000 and above are primarily for graduate students, and only graduate students and selected seniors with consent of the instructor may enroll in them. Courses numbered 3000 and 4000 may be taken for graduate credit if the course number is labeled with an asterisk. Extra work may be required of a graduate student in a 3000- or 4000-level course.

- **General Education Requirements Codes.** The capital letters in parentheses preceding some course titles designate courses fulfilling various undergraduate general education requirements. (See "Academic Regulations."

- **Course Title.** The title of the course is printed in bold-face letters.

- **Statement of Variable Credit.** Each course number ending in zero is followed by a statement of the credit that may be earned. Typical entries are 1-6 credits, maximum 6 and 1-3 credits, maximum 12, the first part of the entry indicating the permissible credit per enrollment, followed by a statement of the maximum credit which may be earned in the course through repeated enrollment.

- **Laboratory Hours.** If a course contains a laboratory, the number per week of laboratory hours are stated, e.g., Lab 3.

- **Prerequisite(s).** Prerequisites from the same department as the course being described are listed first, with no departmental abbreviation and in increasing numerical order. If from another department, that departmental abbreviation must precede the number of the prerequisite course. Those courses having prerequisites from both within and from outside the department bear combination entries such as 3303 and STAT 202.

- **Prerequisites are listed in the following manner:**
  - Prerequisites: A, B or C
  - A or B or C is acceptable
  - Prerequisites: A, B and C
  - A and B and C are required
  - Prerequisites: A, and B or C
  - A and either B or C
  - Prerequisites: A and B, or C
  - Both A and B, or C required

---

**Abbreviations Used**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A&amp;S</td>
<td>Arts and Sciences</td>
</tr>
<tr>
<td>ABSED</td>
<td>Applied Behavioral Studies in Education</td>
</tr>
<tr>
<td>ACCTG</td>
<td>Accounting</td>
</tr>
<tr>
<td>AEROS</td>
<td>Aerospace Studies</td>
</tr>
<tr>
<td>AG</td>
<td>Agriculture</td>
</tr>
<tr>
<td>AGEC</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>AGED</td>
<td>Agricultural Education</td>
</tr>
<tr>
<td>AGEN</td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>AGRON</td>
<td>Agronomy</td>
</tr>
<tr>
<td>ANSI</td>
<td>Animal Science</td>
</tr>
<tr>
<td>ANTH</td>
<td>Anthropology</td>
</tr>
<tr>
<td>ARCH</td>
<td>Architecture</td>
</tr>
<tr>
<td>ART</td>
<td>Art</td>
</tr>
<tr>
<td>ASTRO</td>
<td>Astronomy</td>
</tr>
<tr>
<td>ATHL</td>
<td>Athletics</td>
</tr>
<tr>
<td>AVSED</td>
<td>Aviation and Space Education</td>
</tr>
<tr>
<td>BCOMM</td>
<td>Business Communications</td>
</tr>
<tr>
<td>BIOCH</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>BISC</td>
<td>Biological Science</td>
</tr>
<tr>
<td>BOT</td>
<td>Botany</td>
</tr>
<tr>
<td>BUSAD</td>
<td>Business Administration</td>
</tr>
<tr>
<td>BUSED</td>
<td>Business Education</td>
</tr>
<tr>
<td>BUSL</td>
<td>Business Law</td>
</tr>
<tr>
<td>BUSPR</td>
<td>Business Professions</td>
</tr>
<tr>
<td>CHEM</td>
<td>Chemistry</td>
</tr>
<tr>
<td>CHENG</td>
<td>Chemical Engineering</td>
</tr>
<tr>
<td>CHIN</td>
<td>Chinese</td>
</tr>
<tr>
<td>CIED</td>
<td>Curriculum and Instruction Education</td>
</tr>
<tr>
<td>LIVEN</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>COMSC</td>
<td>Computing and Information Science</td>
</tr>
<tr>
<td>CONST</td>
<td>Construction Management Technology</td>
</tr>
<tr>
<td>CTM</td>
<td>Clothing, Textiles and Merchandising</td>
</tr>
<tr>
<td>EAHED</td>
<td>Educational Administration and Higher Education</td>
</tr>
<tr>
<td>ECEN</td>
<td>Electrical and Computer Engineering</td>
</tr>
<tr>
<td>ECON</td>
<td>Economics</td>
</tr>
<tr>
<td>EDUC</td>
<td>Education</td>
</tr>
<tr>
<td>ECT</td>
<td>Electronics and Computer Technology</td>
</tr>
<tr>
<td>ENGL</td>
<td>English</td>
</tr>
<tr>
<td>ENGR</td>
<td>Engineering</td>
</tr>
<tr>
<td>ENGS</td>
<td>Engineering Science</td>
</tr>
<tr>
<td>ENTO</td>
<td>Entomology</td>
</tr>
<tr>
<td>ENVIR</td>
<td>Environmental Science</td>
</tr>
<tr>
<td>EPT</td>
<td>Electrical Power Technology</td>
</tr>
<tr>
<td>FIN</td>
<td>Finance</td>
</tr>
<tr>
<td>FIRET</td>
<td>Fire Protection and Safety Technology</td>
</tr>
<tr>
<td>FLL</td>
<td>Foreign Languages and Literatures</td>
</tr>
<tr>
<td>FNIA</td>
<td>Food, Nutrition and Institution Administration</td>
</tr>
<tr>
<td>FOR</td>
<td>Forestry</td>
</tr>
<tr>
<td>FRC</td>
<td>Family Relations and Child Development</td>
</tr>
<tr>
<td>FRNCH</td>
<td>French</td>
</tr>
<tr>
<td>GENAD</td>
<td>General Administration</td>
</tr>
<tr>
<td>GENE</td>
<td>Genetics</td>
</tr>
<tr>
<td>GENEN</td>
<td>General Engineering</td>
</tr>
<tr>
<td>GENT</td>
<td>General Technology</td>
</tr>
<tr>
<td>GEOG</td>
<td>Geography</td>
</tr>
<tr>
<td>GEOL</td>
<td>Geology</td>
</tr>
<tr>
<td>GRAD</td>
<td>Graduate</td>
</tr>
<tr>
<td>GREEK</td>
<td>Greek</td>
</tr>
<tr>
<td>GRMN</td>
<td>German</td>
</tr>
<tr>
<td>HEC</td>
<td>Home Economics</td>
</tr>
<tr>
<td>HE ECS</td>
<td>Home Economics Education and Community Services</td>
</tr>
<tr>
<td>HIDCS</td>
<td>Housing, Interior Design and Consumer Studies</td>
</tr>
<tr>
<td>HIST</td>
<td>History</td>
</tr>
<tr>
<td>HLTH</td>
<td>Health</td>
</tr>
<tr>
<td>HORT</td>
<td>Horticulture</td>
</tr>
<tr>
<td>HPPEL</td>
<td>Health, Physical Education and Leisure</td>
</tr>
<tr>
<td>HRAD</td>
<td>Hotel and Restaurant Administration</td>
</tr>
<tr>
<td>IDS</td>
<td>Interdisciplinary Studies</td>
</tr>
<tr>
<td>INDEN</td>
<td>Industrial Engineering and Management</td>
</tr>
<tr>
<td>JTED</td>
<td>Industrial Technology Education</td>
</tr>
<tr>
<td>JAPAN</td>
<td>Japanese</td>
</tr>
<tr>
<td>JB</td>
<td>Journalism and Broadcasting</td>
</tr>
<tr>
<td>LA</td>
<td>Landscape</td>
</tr>
<tr>
<td>LATIN</td>
<td>Latin</td>
</tr>
<tr>
<td>LEIS</td>
<td>Leisure</td>
</tr>
<tr>
<td>LIBS</td>
<td>Library Science</td>
</tr>
<tr>
<td>MAE</td>
<td>Mechanical and Aerospace Engineering</td>
</tr>
</tbody>
</table>
3203 Cost Accounting. Prerequisites: 2203 with a grade of "C" or better and STAT 2023. Cost accumulation systems, allocating product costs, planning and controlling costs, standard costing, and profitability analysis.


3303 Financial Accounting II. Prerequisite: 3303 with grade of "C" or better. Continuation of financial accounting theory and problems.

3603 Accounting Information Systems. Prerequisite: 2203. Accounting system design and installation.

4010 Accounting Projects. 1-6 credits, maximum 6. Prerequisites: instructor. Individual work on special topics, projects, or problems.

4014 Federal Taxation II. Prerequisite: 3013. Federal income tax law applicable to corporations, partnerships, trusts and estates, and other specialized topics. Primary emphasis on determining tax liability of various entities.

4203 Topics in Management Accounting. Prerequisites: 2203 with grade of "C" or better and MGMT 3223. Integrative course in cost and management accounting; use of accounting information for internal decision making.

4303 Non-Business, Fiduciary and Institutional Accounting. Prerequisite: 3403 with grade of "C" or better. Fund and governmental accounting, bankruptcies, receiverships, estates and trusts.

4403 Financial Accounting III. Prerequisite: 3403 with grade of "C" or better. Consolidated statements and other financial accounting topics.

4503 Auditing. Prerequisite: 3403, 3603. Auditing theory, procedures and practices.

4713 International Accounting. Prerequisite: senior level standing. Present-day multinational accounting problems, including world-wide differences in financial reporting, efforts at harmonizing these differences, and planning and control in multinational enterprises.

5000 Thesis. 1-6 credits, maximum 6. For students writing reports and theses in accounting.

5013 Seminar in Tax Research. Prerequisite: 3013 or consent of instructor. Development and administration of federal tax law with emphasis on the development of tax research skills.

5023* Seminar in Estate and Gift Taxation. Prerequisite: 5013 or consent of instructor. Federal tax law applicable to estate and gift taxation and income taxation of estates and trusts.

5033 Seminar in Oil and Gas Taxation. Prerequisite: 5013 or consent of instructor. Federal income tax and its relationship to other forms of taxation; primary emphasis on determination of federal income tax liability of an individual.

5030 Seminar in Oil and Gas Taxation. Prerequisite: 5013 or consent of instructor. Federal income tax law applicable to the petroleum and other extractive industries.

5043* Seminar in Partnership Taxation. Prerequisite: 5013 or consent of instructor. Federal income tax law applicable to partnerships.

5053* Seminar in Corporate Taxation. Prerequisite: 5013 or consent of instructor. Federal income tax law applicable to corporations and to other entities in their capacity as corporate shareholders.

5103* Managerial Accounting. Prerequisite: admission to MBA program or consent of MBA director. Interpretation of accounting data in planning, controlling and decision-making.

5110 Graduate Reading or Individual Work in Accounting. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Individual work on special topics, projects, or readings selected to acquaint students with significant accounting literature.

5203* Seminar in Contemporary Accounting Theory I. Prerequisite: 3403. Origin and development of accounting and a critical study of modern accounting theory.

5303* Seminar in Contemporary Accounting Theory II. Prerequisite: 3403. Critical study of contemporary accounting theory.

5400 Practicum in Professional Accounting. 1-6 credits, maximum 6. Prerequisite: 30 semester credit hours of accounting beyond the accounting policy course studying auditing, tax, systems, internal and external reporting and international aspects of business cases.

5503 Advanced Auditing. Prerequisite: 4503. Emphasis on auditing aspects of EDP, use of statistical sampling techniques in connection with audits of financial data, filings with the SEC and other regulatory agencies and other public accounting related topics.

5603 Accounting-Based Information Systems. Prerequisite: 18 credit hours of accounting including 4203. Concepts underlying the design and use of an effective accounting information system.

5803* Seminar in Cost-Managerial Accounting. Prerequisite: 18 credit hours of accounting. Intensive study of cost managerial accounting theory relating to problems of an advanced nature.

5902 Research Report. Prerequisite: consent of supervising professor and coordinator of graduate programs in accounting. Methods used in research and report writing in accounting. Independent investigation and writing of an acceptable report on a topic approved by the student’s supervising professor. Restricted to candidates seeking the M.S. in accounting degree and not available to students who have credit in 5000.

6000 Research and Thesis. 1-18 credits, maximum 36. Prerequisite: approval of advisory committee. For students working on the doctoral degree.

6110 Graduate Reading in Accounting. 1-3 credits, maximum 12. Prerequisite: consent of supervising professor and coordinator of graduate programs in accounting. Supervised reading of significant literature not included in regularly scheduled courses.

6703 Seminar in Accounting Research. Prerequisites: Doctoral student status and consent of coordinator of graduate programs in accounting. Theoretical literature and research methodology in accounting.

AEROSPACE STUDIES-Air Force (AEROS)

1121 The Development of Air Power I. Lab 1. Growth and development of aerospace power through history beginning with first manned flights and continuing through World War II.

1122 The Development of Air Power II. Lab 1. Development and growth of aerospace power from the period following World War II through the Viet Nam conflict; concepts of peaceful deployment of US air power.

2101 The Air Force Today I. Lab 1. Doctrine, mission and organization of the United States Air Force through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces.

2102 The Air Force Today II. Lab 1. Continuation of the doctrine, mission and organization of the United States Air Force; review of Army, Navy, and Marine general purpose forces.

ACCOUNTING (ACCTG)

2103 Principles of Accounting. Prerequisite: 24 semester credit hours, including ENGL 1113 and MATH 1513 or equivalent. Financial accounting covering the accounting process and principles of accrual accounting.

2203 Principles of Accounting. Prerequisite: 2103. Managerial accounting concepts and objectives, planning and control of sales and costs, analysis of costs and profits.

3013 Federal Income Taxation. Prerequisite: 2203. Federal income tax and its relationship to other forms of taxation; primary emphasis on determination of federal income tax liability of an individual.

3103 Survey of Accounting Principles. Elementary financial and cost accounting with special emphasis on statement interpretation and industrial problems. No credit for students with credit in 2103 or 2203.

2113 Seminar in Oil and Gas Accounting. Financial accounting and reporting rules and practices in the petroleum industry.

2503* Seminar in Contemporary Accounting Theory I. Prerequisite: approved for Graduate Credit.
Agricultural Economics (AGEC)

1114 Introduction to Agricultural Economics. Economic theory of production, marketing and consumption of agricultural products and the role and structure of agriculture in the American economy. Policies to achieve efficiency and welfare goals in agriculture.

2103 Principles of Economics Applied to Agriculture. Prerequisite: 1114. Macroeconomics theories: national economic problems including inflation, unemployment, and monetary and fiscal policies and their impacts on agricultural industries and farms.

3010 Internship in Agricultural Economics. 1-6 credits, maximum 6. Prerequisite: approval of internship committee and adviser. Supervised work experience with approved public and private employers in agricultural economics including banks, farm credit services, agricultural chemical firms, Soil Conservation Service, congressional offices and other opportunities. Credit will not substitute for required courses. Graded on pass-fail basis.

3203 Agriculture Price Analysis. Prerequisites: 1114, 3213 or AG 2112, MATH 1513. Economic theory, statistics and data combined to describe, understand and forecast agricultural price relationships and variation. Quantitative techniques developed to determine the factors causing price variation and to measure trend, cyclical, seasonal and random price variation.

3213 Quantitative Methods in Agricultural Economics. Lab 2. Prerequisites: 1114, MATH 1513. Indecies, graphics, budgeting, discounting, basic statistical measures, use of economic indices in price analysis. Basic background methods for some courses involving analysis.

3303 Agricultural Marketing. Prerequisites: 1114, MATH 1513. The agricultural marketing system, its importance to the economy and the role of the individual firm manager. Futures markets, hedging, and the use of decision aids.

3313 Agricultural Business Management and Finance. Prerequisites: 5103 and ACCTG 2103. Managerial functions and application to agricultural firms. The acquisition, organization and management of personal, natural and physical assets. Procurement and merchandising strategies under different economic conditions. Decision-making, problem-solving and operational strategies stressed.

3403 Agricultural Business Records and Analysis. Lab 2. Prerequisites: 3413 and ACCTG 2103. Financial accounts, production and statistical records and their practical application to the successful management of the farm or ranch and other agricultural businesses.

3413 Farm and Ranch Management I. Lab 2. Prerequisites: 1114, MATH 1513. Production planning with budgeting, financial records and income tax management for the individual farm-ranch business.

3503 Natural Resource Economics. Prerequisite: 1114. Economic, social, physical, institutional factors in a framework for analyzing problems and policies. Demand and supply of natural resources, externalities, ownership rights, government regulation.

3603 Agricultural Finance. Prerequisites: 3413, ACCTG 2103. Farm financial management: preparation and analysis of financial balance sheets, including microcomputer applications; financial intermediaries; serving agriculture; procedures for evaluating investments; alternative means of acquiring control of farm resources.

3990 Special Problems in Agricultural Economics. 1-3 credits, maximum 3. Directed study of selected agricultural economics topics.

4313 Agricultural Marketing and Prices. Prerequisites: 3213, 3313 and 3303. Agricultural marketing, with emphasis on system-wide approaches. Economic tools and techniques for making decisions.

4323 Cooperative Organization and Management. Prerequisite: 3303. Objectives, structure and management of cooperative organizations; cooperatives in the modern economy-history, legislation and evaluation.


4343 International Agricultural Markets, Trade and Development. Prerequisites: 2103 and 3303. International trade of agricultural products with emphasis on the theory of trade and monetary flows, national trade policies and world market structures for agricultural products. Impacts of trade on the domestic agricultural sector and the role of trade in agricultural economics.

4403 Farm and Ranch Management II. Prerequisites: 3603 and MATH 1513. Production planning with linear programming and other tools and methods of planning under uncertainty and decision-making and the use of information systems in managing the individual farm-ranch business.

4413 Agricultural Law. Prerequisites: 1114 and junior standing. Survey of law with emphasis on agricultural problems and applications Contract law, tort law, property law, real estate transactions, oil and gas leases, business organization, estate planning and credit.

4503 Environmental Economics and Resource Development. Prerequisites: 1114 or ECON 2123. Economic, social, and political factors affecting natural resource development and environmental quality. Legislation and role of government agencies in resource conservation and development. Recreational, aesthetic and other qualitative considerations relating to natural resources and environment.

4513 Farm Appraisal. Lab 2. Prerequisite: 3413. Estimating the market value of agricultural real estate using the three approaches to value. Determining the feasibility and profitability of land purchases.

4703* American Agricultural Policy. Prerequisites: 1114 and upper-division standing. Economic characteristics and problems of agriculture; evolution and significance of programs and policies.

4723 Rural Economic Development. Prerequisite: 1114. Concepts and theories of regional and community economics, including input-output, economic base, simulation, budget location, and routing. Oklahoma applications.

4902* Agricultural Economics Seminar. Prerequisite: senior standing in agricultural economics. Contemporary problems in agricultural economics; career exploration; agriculture in the economics of the nation and the world.

4911 Agricultural Economics Seminar. Prerequisite: senior standing in agricultural economics. Contemporary problems in agricultural economics; agriculture in the economics of the nation and the world. Individual senior reports and group discussion of reports.

4990 Problems of Agricultural Economics. 1-6 credits, maximum 6. Open to students with consent of instructor only. Research on special problems in agricultural economics.

5000* Thesis or Report in Agricultural Economics. 1-6 credits, maximum 6. For students working for a M.S. degree in agricultural economics. Independent research and thesis under the direction and supervision of a major professor.

5010 Professional Experience in Agricultural Economics. 1-6 credits, maximum 6. Prerequisites: approval of internship committee and adviser. Supervised professional experience with approved public and private employers in agricultural economics including banks, production credit associations, federal land banks, soil conservation service, and other agricultural related firms. Credit will not substitute for required courses. Designed for Master of Agriculture program.

5101 Research Methodology. The philosophical bases for research methods used in agricultural economics. Alternative research methods compared. Alternative approaches to planning, managing and performing research.

5102 Teaching Practicum in Agricultural Economics. Lab 4. Prerequisites: two semesters of graduate study in agricultural economics. Philosophies and techniques of teaching, general tasks performed by a teacher, student counseling, test and exercise preparation and grading, and lecture organization, preparation and presentation.

5103 Mathematical Economics. Prerequisites: differential calculus and ECON 3113. Mathematical tools necessary for formulation and application of economic theory and economic models.

5110* Applications of Mathematical Programming. 1-3 credits, maximum 3. The application of concepts and principles of existing linear and nonlinear programming techniques to agricultural problems.

5203 Advanced Agricultural Prices. Prerequisite: 5103. STAT 4043. Demand and price structures, price discovery, time series and agricultural price research methods.

5231 Agricultural Market Policy and Organization. Marketing firm decisions; structure, conduct and performance of agricultural industries; interregional trade theory; and government policies that influence decisions.

5313 Food Distribution Systems. Analysis of market structure; operational and pricing efficiency; organizational and operational decision making in food distribution firms.

5403* Production Economics. Prerequisite: 5103. Analysis of micro static production economics problems; factor-price and factor-factor and product-product relationships; functional forms for technical unit and aggregate production functions; maximizing and minimizing choice rules; firm cost structure; scale relationships.
5603 Resource Administration and Environmental Policy. Economic analysis, particularly benefit-cost analysis. Development and administration of environmental and economic policies related to the quality of the environment, including land, air, water and related resources, analyzed in an economic framework.

5603* Advanced Agricultural Finance. Prerequisite: 5603. Financial structure of agriculture, firm financial planning and management, financial intermediation in agriculture and agricultural finance in developing countries.

5703 Econometrics of Agriculture and Food Policy. Prerequisite: 4703 and 5103. Application of welfare criteria and economic analysis to agricultural, food and rural development problems and policies.

5713 Rural Regional Development. Prerequisite: 5103. Concepts of rural resource development and delineation of problem areas; theories of regional growth as applied to rural areas; analysis of policies and programs for stimulating rural development.

5723 Development Planning and Project Appraisal. Economic analysis of development planning; methods of development planning with special emphasis on the analysis of agricultural projects and the economics of agricultural sector planning for developing countries.


5990 Advanced Studies. 1-6 credits. Maximum 6. Open to graduate students with consent of instructor only. Investigation in designated areas of agricultural economics.

6000 Research Problems. 1-15 credits, maximum 24. Open to students pursuing graduate study in agricultural economics beyond the requirements for a master's degree. Independent research and thesis under the direction and supervision of a major professor.

6103 Advanced Mathematical Economics. Prerequisites: 5103 and MATH 3013. General presentation of static and dynamic economic models, utility theory followed by applications to micro-economic theory.

6113* Systems Analysis for Agriculture. Prerequisites: 5103, STAT 4303, knowledge of BASIC or FORTRAN. Methodology of systems modeling developed. Problem definition, design of abstract models and the simulation of dynamic agricultural systems with time delays, storage, feedback and stochastic variation. Theory and application of modeling with differential equations and optimal control procedures.

6203 Econometric Methods. Prerequisites: 5103, and STAT 4203. Application of econometric techniques to agricultural economic problems, theory and estimation of structural economic parameters.

6215 Advanced Econometrics. Prerequisite: 6203 and MATH 3013. General presentation of large sample theory followed by applications to general linear models, general nonlinear models, simultaneous equation models, time series models, and probability models.

6300 Agricultural Marketing Seminar. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Current developments in theory and application of evaluating marketing behavior, market legislation and market development.

6303 Advanced Agricultural Marketing. Prerequisite: 5303. Marketing theories, structures and performance, governmental regulation and policy, and bargaining in agricultural markets.

6400 Seminar in Farm Management and Production Economics. 1-6 credits. Maximum 6. Prerequisite: 5403 or consent of instructor. Scientific research methodology applied to problems of resource efficiency.

6403 Advanced Production Economics. Prerequisite: 5403. Micro economic production economics under risky conditions; recent developments in agricultural risk management, measuring utility, stochastic efficiency and decision theory; potential application of inventory replacement, simulation, game theoretic, Bayesian and nonparametric-probabilistic models in production economics research.

6700 Agricultural Policy and Rural Resource Development Seminar. 1-2 credits, maximum 2. Frontier issues in agricultural policy, natural resources and rural development.

Agricultural Economics

3103 Foundations and Philosophy of Teaching Vocational Agriculture. Lab. 2. Prerequisite: 21 semester credit hours of agriculture with a 2.50 GPA. Roles and responsibilities of the vocational agriculture teacher; types of program offerings; steps of the teaching-learning process; place of vocational agriculture in relation to other educational programs in school systems.

3203 Planning the Community Program in Agricultural Education. Lab 2. Prerequisite: 3103. Determining resources and trends of local communities with respect to agricultural production and agribusiness. Emphasis on institutional program planning and concurrent coursework in other related areas. Identification of project and reports required of a teacher of vocational agriculture in Oklahoma.

3302 Organizing Agricultural Programs for Rural Groups. The nature of adult learning; methods of organizing and implementing educational programs for adult groups and individuals; dynamics of group action; application of the most effective methods and techniques for assisting adults to solve problems in agriculture and community living.

3403 Programs and Personnel of the Cooperative Extension Service. 1-2 credits, maximum 1. Planned experiences in agricultural education career areas to acquaint students with the diversity of responsibilities and audiences served. Course planning to satisfy requirements for admission to teacher education and student teaching and to develop technical competence.

4103* Methods of Teaching and Management in Vocational Agriculture. Lab 2. Prerequisite: 3203, junior standing in the College of Agriculture and admission to the University Teacher Education program and concurrent enrollment in 4200. Facets of the teaching-learning process including teaching methods, basic teaching skills, proper classroom management techniques and motivational techniques and ideas. Preparation for student teaching which is to be complete during the same semester.

4200 Student Teaching in Vocational Agriculture. 10 credits. Lab 30. Prerequisite: 3203, junior standing in the College of Agriculture, admission to the University Teacher Education Program, and concurrent enrollment in 4103. Full-time directed experience in an approved vocational agriculture department. Development of a philosophy of teaching skills, techniques of evaluation, selecting, adapting, utilizing, evaluating curriculum materials and experiences to meet educational goals and facilitate learning for individual students. Roles, responsibilities, interactions, of school personnel and parents. Study of professional education programs and organization/operation of school systems.

4300 Agricultural Education Internship. 3-10 credits, maximum 10. Prerequisites: professional course sequence and consent of advisor/internship coordinator. Superintended full-time internships in approved county extension offices, businesses or governmental agencies, for students preparing for agricultural education. Not intended for teacher certification. Maximum credit requires a 12-week internship in addition to a report.


4990 Seminar and Problems in Agricultural Education. 1-3 credits, maximum 6. Small group and/or individual study and research in problems relating to programs of occupational education in agriculture.

5000 Research and Seminar. 1-6 credits, maximum 6. Independent research and thesis under the direction and supervision of a major professor.

5103* Organizing Curriculum and Programs of Vocational Agriculture. 1-3 credits, maximum 6. Studies of student and community agricultural needs as bases for localizing, personalizing and utilizing a basic core curriculum and other components essential to effective local vocational agriculture programs.

5122 Adult Education: Organization and Method. Determination of the functions of adult education for the community. Securing and organizing the information needed for adult education programs and planning teaching activities.

5300 Extension Teaching Methods. 1-3 credits, maximum 6. Teaching methods applicable to extension work, their relationships and relative effectiveness. Result determination, method demonstration, meetings, tours, field days, exhibits, etc.

5402 Young Farmer Organizations. Purposes and objectives of youth organizations; development and utilization of curriculum for instructional programs for establishing and operating local chapters with emphasis on the role of the vocational agriculture teacher as adviser. Determining educational needs and interests of members. Securing and organizing information for individual and group instruction, planning training activities. Tours and/or field trips to observe programs in operation.

5500 Directing Programs of Supervised Training. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Determining the supervised training needs and opportunities of individual students. Planning for supervision of vocational agriculture training programs and 4-H club projects. Analysis of training opportunities in production agriculture, agricultural businesses and individual career development.

5752 Guidance and Leadership Development of Agricultural Youth. Providing for guidance of youth into farming and agricultural occupations. Sponsoring and advising youth groups; developing leadership through the local FFA chapter, 4-H Club and other youth organization and groups.


5822* Advanced Methods of Teaching Agriculture. Developing facility in the use of conferences, demonstrations, role playing, interpreting and guiding individual and group projects, supervised or directed study, surveys, visual aids and forms of programmed learning.

5862 Curriculum Design and Methodology of Alternative Approaches in Agriculture. The methodology of development and utilization of curriculum for instructional programs focusing upon alternatives in agriculture and agribusiness, including alternative programs and co-curricular projects, supervised or directed study, surveys, visual aids and forms of programmed learning.

4990* Agricultural Education Workshop. 1-3 credits, maximum 8. For experienced teachers. Curriculum problems, farm practices adapted to different types of farming areas in Oklahoma. Development of units of instruction and methods of teaching or other special concerns in vocational agriculture.
5980 Research Design in Occupational Education. 1-3 credits. Prerequisite: ENTR 3200. Design and development of course and curriculum. Emphasis on educational statistics. Research design, research design, and the computer are emphasized. Studies in vocational and technical education are reviewed and proposals for graduate research papers prepared.


6120 Teaching Agriculture in Higher Education. 1-3 credits. Prerequisites: 4001. Current issues and practices in teaching agriculture in higher education. Critical analysis of research articles related to special problems or investigation in designated areas of agricultural education.

6000 Research in Agricultural Education. 1-16 credits, maximum 16. Prerequisite: approval of major adviser. Open to students pursuing graduate study beyond the requirements for a master’s degree. Independent research and thesis under the direction and supervision of a major professor.

6100 Developments in Agriculture and Extension Education. 1-3 credits. Prerequisites: 6000. Review of developments in agricultural and extension education. Discernment of the accountability concept to educational and social implications. Trends and developments in educational policies and programs. Experiences in teaching agriculture in higher education. Functional relationships with other agencies.

6200 County Extension Program Development. 1-3 credits, maximum 6. Prerequisites: 6000. Critical analysis of research articles related to special problems or investigation in designated areas of agricultural education. Problems in agricultural and extension education. Functional relationships with other agencies.

6200 Assessment and Evaluation of Educational Programs in Agriculture. 1-3 credits, maximum 6. Prerequisites: 6000. Critical analysis of research articles related to special problems or investigation in designated areas of agricultural education. Problems in agricultural and extension education. Functional relationships with other agencies.

AGRICULTURAL ENGINEERING (AGEN)

1011 Introduction to Surveying. Lab 3. Prerequisite: trigonometry. Fundamentals of surveying including leveling, topographic surveying, boundary surveys and the layout of engineering facilities.

1302 Agricultural Engineering Principles. Lab 4. Prerequisite: MATH 1310, 1311. Required of all freshman in the College of Agriculture. Methods of study, advisement system, organization of curriculum and discussion of requirements and career opportunities in various fields of agriculture. Graded on pass-fail basis.


3113 Environmental Engineering. Prerequisites: 3013. PHYS 2114. Phyisiologic mechanisms by which plants and animals adjust to their environment. Envrionmental control for animal and plant structures. Equipment and facilities used for environmental control of animal and plant structures.

3212 Agricultural Machinery. Prerequisites: 2012 and ENGS 2122. Analysis and operation of agricultural machinery, soil dynamics and tillage machinery, selection and management of agricultural machinery.

3323 Hydraulic Applications in Soil and Water. Prerequisite: 3013. Design of irrigation systems, open channel flow systems, and conservation structures. At least one-half devoted to design methodology for hydraulic systems used in soil and water conservation.

3413 Agricultural Process Engineering. Lab 2. Prerequisite: 3113. Physical properties of agricultural materials. Grain storage, drying and handling. Special emphasis on the design of systems for grain storage, grain drying, and materials handling.

4001 Seminar. Prerequisite: senior standing. Technical and professional literature including preparation and presentation of papers.

4023* Agricultural Equipment Design. Lab 3. Prerequisites: 3023, 4212. Senior design course. Project selection, patent search, market evaluation, and design of machine elements. Students will participate as design team members through prototype construction and evaluation.

4113 Design of Agricultural Structures. Prerequisite: 4010. Prerequisites: 3013, 3212, ENGS 2213. Tractors in agricultural power units; fuels; accessories and their relationship to tractor performance; tractor stability and traction. Design of power systems for agricultural applications.

4212 Agricultural Power. Prerequisites: 3013, 3212, ENGS 2213. Tractors in agricultural power units; fuels; accessories and their relationship to tractor performance; tractor stability and traction. Design of power systems for agricultural applications.


4313 Introduction to Hydrology. Prerequisites: CHEM 1515, PHYS 2140, LIVEN 3853 or AGEN 3013. Surface and groundwater hydrology and their application in engineering problems. The hydrologic cycle, weather and hydrology, precipitation, evaporation, transpiration, subsurface waters, stream flow hydrographs, hydrologic and hydraulic stream routing, probability of hydrologic events, application of hydrologic models. Same as CIVEN 3843.

4400 Special Problems. 1-4 credits, maximum 4. Investigations in specialized areas of agricultural engineering.


5000 Thesis and Research. 1-6 credits, maximum 6. Prerequisite: approval of major professor. Open to students pursuing research projects beyond the requirements for a master’s degree. Independent research and thesis under the direction and supervision of a major professor. Open to students pursuing research projects beyond the requirements for a master’s degree. Independent research and thesis under the direction and supervision of a major professor.

5030 Engineering Practice. 1-12 credits, maximum 12. Prerequisite: B.S. degree in agricultural engineering. The identification, analysis and synthesis of an authentic problem in agricultural and biological engineering. Solution of the problem will involve making engineering decisions tempered by real-time restraints, economic realities, and limited data with due consideration for environmental and social implications.

5413 Instrumentation in Biological Process Control System. Prerequisite: 3023 or equivalent. Analysis of transducers and transducer aspects. Applications to the control of biological processes. Emphasis on selection of measurement techniques and transducers to sense physical properties of biological materials. Application to agricultural and food processing industries.

5501 Seminar. Discussion of current literature with special emphasis on research and experimental techniques.

5513 Experimental Engineering Analysis. Prerequisite: STAT 4023. Design and analysis of engineering experiments, error sources and prediction equations using statistical theory.

6000 Research and Thesis. 1-10 credits. Maximum 30. Prerequisite: approval of the student’s advisory committee. Independent research and thesis preparation under the guidance of a graduate faculty member in the student’s field of specialization.

6313* Stochastic Methods in Hydrology. Prerequisites: 4313 or CIVEN 5843 and STAT 4553 or equivalent. Stochastic and statistical hydrologic analyses of surface water and groundwater systems. Analysis of urban and rural drainage and detention systems. Same as LIVEN 6843.

6323* Advanced Irrigation Engineering. Prerequisite: 3323 or equivalent. Hydraulic theory and design and operation of surface, sprinkler, and trickle irrigation systems. Management of water and energy in irrigated agriculture.

6333 Fluvial Hydraulics. Prerequisites: 3013 or equivalent. Principles of sediment detachment and transport in fluvial systems. Design of stable channels and flow resistance relationships for sediment-laden flows.

6503 Similitude in Research. Prerequisite: MATH 2613. The use of dimensional analysis and use of model testing and analyzing experiments in engineering and biological sciences.

6520 Problems in Soil and Water Engineering. 2-6 credits, maximum 6. Prerequisite: consent of instructor. Problems associated with erosion control, drainage, flood protection and irrigation.

6540 Problems in Farm Power and Machinery. 2-6 credits, maximum 6. Prerequisite: consent of instructor. Literature review and analytical studies of selected farm power and machinery problems. Written report required.

6580 Problems in Transport Processes. 2-6 credits, maximum 6. Prerequisite: consent of instructor. Literature review and analysis of heat and mass transport and intercellular diffusion in biological materials. Transport phenomena at interfaces, thermal and crogogenic processing, drying, packed and fluidized bed systems. Thermal and moisture control processing affecting quality of fruit products. Written report required.

6610 Advanced Research and Study. 1-10 credits, maximum 10. Prerequisite: approval by the student’s advisory committee. Research and study at the doctoral level on the topic related to the student’s doctoral program and field of interest.

AGRICULTURE (AG)

1011 Orientation. Required of all freshman in the College of Agriculture. Methods of study, advisement system, organization of curriculum and discussion of requirements and career opportunities in various fields of agriculture. Graded on pass-fail basis.

2112 Microcomputer Techniques in Agriculture. Lab 2. Operation and capabilities of microcomputers in agricultural applications. Simple programming, data analysis, graphical display, spread sheets, word processing.

3010 Internships in Agriculture. 1-3 credits, maximum 12. Students shall apply for internship with the industry or government agencies including cooperating veterinarians. Graded on pass-fail basis.

4010 Honors Seminar. 1-6 credits, maximum 6. Role of agriculture in society and adjustments to change in the economy.

4453 Communications in Agriculture. Fundamentals of newswriting and other communication methods; the role of the news media in agriculture and related fields. Same course as JU 4453.
AGRONomy (AGRON)

1213 Crop Production. Soils and cropping practices neces-
sary for future crop production systems. Production of modern crops and their management, as well as the adaptation of major agronomic crops to varying edaphic and climatic conditions. Importance of crop production to the producer and the consumer.

2012 Agronomic Internship. 1-6 credits, maximum 6. Prereq-
quisite: consent of instructor. Internship must be at an approved agribusiness unit or other agency serving agronomic agriculture. Requires a final conference with on-campus advisor and a written report. Graded on a pass-fail basis.

2041 Agronomic Orientation. Prerequisite: sophomore stand-
ing in agronomy. Development and improvement of written and oral communicative skills; orientation to agronomic research and extension activities; academic requirements and procedures. Graded on pass-fail basis.

2124 (L) Fundamentals of Soil Science. Lab. 2. Prereq-
quisite: CHEM 1215. Principal physical, chemical and bio-
logical properties of the soil related to plant growth; soil testing and fertilizer usage; formation and classification of soils, rural and urban land use.

3111 Weed Control Laboratory. Lab 2. Prerequisite: 1213 and 3112 (or concurrent enrollment). Identification of common weeds, principles and practices of weed control, application, and equipment, handling and proper use of herbicides.

3112 Principles of Weed Control. Prerequisite: 1212. Weed control principles and practices included in cultural and chemical weed control. Current weed control practices in crops, rangeland and crop situations.

3213* Pasture Management and Forage Production. Prereq-
suits: 1213, 2124, and MATH 1213. Pasture sys-
tems, livestock management and forage crop produc-
tion for maximum economical production of introduced forage species.

3433* Soil Genesis, Morphology, and Classification. Lab 3. Prerequisite: 2124. Basic principles dealing with how and why soils differ, their descriptions, geographic dis-
tributions and modern classification of soils. Soil gene-
esis and classification a prerequisite to sound land use planning and land management.

3554* (N) Plant Genetics. Lab. 2. Prerequisites: BISC 1304. Basic principles of heredity. Interrelationship between classical genetics and molecular genetics. Mendelian genetics, cytogenetics, mutations, gene regu-
lation and genetic engineering.

3781 Market Grain Technology. Lab. 2. Prerequisite: 1213. Quality characteristics of grain for commercial use: iden-
tification of different market classes of grain, quality fac-
tors, and admixtures affecting the commercial grade; practice in grading grain using the federal grain standards.

3792 Seed Technology. Lab. 6. Prerequisite: 1214. Tech-
nique, factors and practices in determining seed purity and germination; principles of seed testing; laws and regulations governing the production, processing, han-
dering and marketing of seed.

3851 Soil Chemistry. Prerequisite: 2124. The chemical and mineralogical properties of soils, weathering and synthe-
sis of minerals in soils, cation exchange and plant nutri-
tion, mechanisms of ion uptake by plants and the role of the soil-borne elements in plant nutrition.

3914 Principles of Range Management. Lab 2. Prereq-
suits: 1213, 2124, Range management; livestock and vegetation response to graz-
ing pressure, seasonal effects, drought, and fire; range plant identification; range sites and condition.

4080 Agronomy Internship. 1-6 credits, maximum 6. Prereq-
quisite: consent of instructor. Internship must be at an
approved agribusiness unit or other agency serving agronomic agriculture. Requires a final conference with on-campus advisor and a written report. Graded on a pass-fail basis.

4112* Advanced Weed Science. Prerequisites: 3112 and 3111. Integrated approach for weed management. Weed life cycles and biology, weed crop interferences, herbicide families and their characteristics, and finally a systematic and integrated weed management system. Methods of conducting and interpreting research results in appropriate topics.

4123* Crop Physiology. Prerequisites: 1213 and BOT 3463. Application of basic physiological concepts of growth and cultural management and underlying crop produc-
tion; environmental and genetic effects on growth of crop plants. Plant ecosystems at the community level relative to optimum yields and quality.

4210 Describing and Interpreting Soils. 1 credit, maximum 3. Lab 3. Prerequisite: 2124. Describe and classify soil profiles in the field and interpret for suitable agricul-
ture, urban, and other land uses.

4234* Soil Fertility and Management. Lab 2. Prerequisite: 2124. Soil fertility principles and practices of crop fertilization and use of fertilizer materials for maximum economical production of introduced forage species.

4263* (I) International Agriculture and Food Production. Introduces the world food supply system, institutional structures needed to promote rural development, and to increase agricultural production in the developing countries.

4293 Plant Response to Environmental Stress. Prereq-
suits: BOT 3463 or concurrent enrollment. Effects of environmental factors on plants including mechanisms of stress resistance, stress specificity. Speciﬁc stress include: drought, ﬂooding, freezing, heat, salinity and radio-
ation. Environmental effects on whole plants and cells in relation to crop development and production.

4351 Plant Breeding. Prerequisite: 2124. Principles dealing with the improvement of plants through application of genetic principles.

4360* Soils of Oklahoma and Their Utilization. 1-3 credits, maximum 3. Open to anyone interested in using soil infor-
mation. Discussion of Oklahoma soils and their interpre-
tation for agricultural and non-agricultural users for increased food production and for environmental improvement. Preparations of interpretive maps, soil judging in the ﬁeld, evaluations of work-and-do reports.

4463* Soil and Water Conservation. Prerequisite: 2124. Con-
serveration and management of soils for the prevention of losses by wind and water erosion.

4470* Problems and Special Study. 1-3 credits, maximum 12. Prerequisite: consent of instructor. Problems in agronomic crops which include range and turf, plant breeding and genetics, weed control, soil chemistry and fertility, soil physics, soil biology, soil conservation and soil morphology; spring travel course.

4483 Soil Biology. Prerequisite: 2124. Soil ecology of microorganisms, biological transformations, humus com-
pounds, pesticide decomposition, plant nutrient cycles, microﬂora of rhizosphere.

4571 Senior Seminar. Prerequisite: senior standing in agronomy. Career opportunities (talks and ﬁeld trips); preparation of resumes and interviews. Graded on a pass-fail basis.

4673* Grain Crops. Lab 2. Prerequisite: 1213. Production, dis-
tribution, classiﬁcation, utilization and improvement of the major cereal crops.

4693* Physiological Properties of Soils. Prerequisites: 2124 and PHYSC 1114. Soil physical properties and processes, and their inﬂuence on plant growth.

4772* Oiled, Pulse and Mucilage Crops. Prerequisite: 1213. Production, utilization and improvement of oilseed, pulse and mucilage crops with special emphasis on peanuts and soybeans.

4783* Cotton Production. Prerequisite: 1213. Production, utili-
zation and improvement of cotton. Several other agron-
monic ﬁber crops brieﬂy discussed.

4913 Pesticides in the Environment. Prerequisites: BISC 1403, CHEM 1255. A discussion of pesticides (chiefly fungicides, insecticides, herbicides) and their effects on the environment, including potential movement, degradation, fate and sig-
niﬁcance in the environment. Same course as ENTO 4913 and PPL 4913.

4934 Range Ecology. Prerequisite: 3914. Ecological princi-
ples pertaining to rangelands with emphasis on soil, plant and animal relationships. Characteristics of major range ecosystems and range plants.

4953* Soils of the World. The major soils of the world dis-
cussed with regard to factors responsible for their for-
mation, developmental causes of soil differences and resulting effects on utilization for food production. Inter-
national soil maps used to correlate soil characteristics with potential use.

4984 Range Improvement. Lab 3. Prerequisites: 3914, AG 2112. Methods of improving or maintaining range con-
ditions and production. Grazing management; chemical, mechanical, and burning treatments; and physical developments. Field trips and reports in laboratory.

4973 Range and Ranch Planning. Lab 4. Prerequisite: 4954, AN 3570. Use of range resource survey, inventory and monitoring. Inventory of ranch resources, survey and evaluation of ranch practices, and economic analysis. Development of a comprehensive ranch management plan. Field trips and reports in laboratory. Same course as ANSI 4973.

4990* Special Topics in Range Management. 1-3 credits, maximum 3. Prerequisite: 15 hours of range manage-
ment. Advanced topics and new developments in range management.

5000 Masters Thesis. 1-6 credits, maximum 6 total credits under Plan I, and 2 maximum total credits under Plan II. Prerequisite: consent of adviser in agronomy. Research topic, direction and progress of research leading to a master’s thesis and thesis defense.

5020* Graduate Seminar. 1 credit, maximum per semester 1 credit on M.S. program and 2 credits on a Ph.D. pro-
gress report. Prerequisite: graduate standing. Philoso-
phy of research, methods of research, or interpretation of research in agronomy.

5113 Herbicide Fate in the Environment. Prerequisites: 4112. Processes involved in the behavior and fate of herbi-
cides in air, soil, and water. Reaction, movement and dissipation of herbicides in soil.

5193* Data Acquisition and Analysis in Agronomic Sys-
tems. Prerequisites: one course in statistics, computer programing experience, and consent of the head of the agronomy department. Use of microcomputers for data acquisition and control of field and laboratory instru-
ments in agronomic applications. Management and anal-
ysis of data on microcomputer and main-frame systems. Practical experience in the use of graphics, data man-
agement, statistics, and inter-computer communica-
tion. Prerequisites: 5112, 5000, BIOCH 3653. Data Acquisi-
tion and Analysis in Agronomic Systems.

5412 Advanced Crop Physiology. Lab. 4. Prerequisites: 4123, BIOCH 3653. Physiological concepts underlying culture and growth of crop plants. Plant physiology and biological processes.

5353* Advanced Soil Genesis and Classification. Lab 2. Prerequisite: 3433. Processes and factors of soil forma-
tion, comparison of world soil morphology and classi-
fication systems.

5411* Plant Breeding Techniques. Lab. 2. Prerequisites: 2124 and PHYSC 1114. Practical and theoretical bi-
ological concepts of growth and development of crops. Design and management of other breeding problems including cytogenetics, biochemical and statistical techniques.

*Approved for Graduate Credit
Approved for Graduate Credit
## ANTHROPOLOGY (ANTH)

### 353
**General Anthropology.** Anthropology, emphasizing the study of human physical evolution (physical anthropology) and cultural evolution (archaeology).

### 355
**Cultural Anthropology.** Introduction to culture, various subdisciplines of cultural anthropology, anthropological concepts and capsule ethnographies of assorted ethnic groups.

### 4023
**North American Indian Cultures.** Precontact and traditional subsistence patterns, social organization and ideology with emphasis on specific groups in each culture area.

### 4123
**Archaeology of North America.** Factors influencing the initial peopling of North America, the spread and diversification of hunting and gathering economies, the rise of agricultural systems and emergence of extensive and complex political units.

### 4633
**Racial and Cultural Minorities.** Ethnic and racial groups in contemporary pluralistic society, including a cultural-historical perspective on their origins, social relations, value systems and goals.

### 4643*
**Women: A Cross-Cultural Perspective.** Compares the roles of women in different types of societies (hunting and gathering, horticultural, peasant and agricultural). Social, familial, economic and legal status of women in American society. Same course as SOC 4643.

### 4823*
**Contemporary Native Americans.** Cultural adaptations of North American Indians within both contemporary ‘traditional’ communities and urban settings. Federal programs and current problems as they relate to the adaptive processes.

### 4883
**Comparative Cultures.** Compares environments, economics, social and political organizations and other aspects of culture among selected literate and preliterate societies.

### 4953*
**Anthropological Theory.** Significant theoretical formulations in cultural anthropology. Relationship between theoretical developments and research emphasis.

### 4990
**Special Topics in Anthropology.** 1-3 credits, maximum 6. Prerequisite: consent of instructor. Directed readings or research on special topics in anthropology.

### 4993
**Anthropology of Aging.** Study of aging using anthropological theory and method; includes aging in different societies, effect of culture change on aging and role culture plays in aging process.

### APPLIED BEHAVIORAL STUDIES IN EDUCATION (ABSED)

### 1112
**World of Work.** Assists students in exploring career options through increased understanding of self and expanded knowledge of occupational information. Includes a study of the decision-making process and a look at the present and future changing world of work.

### 3013
**Leadership Concepts.** Prerequisite: 12 hours completed course work. Increases undergraduate student competence through the study of leadership concepts. Stressses communications, decision-making, leadership styles and theories and group dynamics. Attempts integration of theoretical concepts with reality of application within the university community.

### 3092
**Counseling and Guidance for Dormitory Personnel.** Principles and practices involved in counseling and supervising students.

### 3113*
**Psychological Foundations of Childrehood.** Prerequisite: PSYCH 1113. The child from conception to puberty with focus on educational implications of development in cognitive, affective and psychomotor domains.

### 3202
**Education of Exceptional Learners.** Learning characteristics, needs and problems of educating the exceptional learner in the public schools. Implications of the learning, environmental and cultural characteristics; planning and program assistance available for accommodating the exceptional learner in regular and special education programs; observation of exceptional learners.

### 3213*
**Psychology of Adolescence.** Prerequisite: PSYCH 1113. The adolescent from pubescence to adulthood with focus on educational implications of development in cognitive, affective and psychomotor domain.

### 3240*
**Observation and Participation in Special Education.** 1-3 credits, maximum 6. Lab 1-3. Supervised activities with various types of exceptional learners and the education provisions for them.

### 3413
**Child and Adolescent Development.** Prerequisite: PSYCH 1113. The person from conception through adolescence and preadolescence. Development of various intervention strategies and assessment techniques.

### 3633
**Assessment and Intervention for Exceptional Infants and Children-Birth to Age 6.** Prerequisite: 3202. Assessment techniques and intervention strategies appropriate for exceptional infants and young children. Basic theories of development and research techniques used to summarize and analyze test results.

### 3648*
**Exploration of the Creative Experience.** Prerequisite: senior standing. The creative experience in art (visual to performing), articulation (oratory to literature), thought (philosophy to psychology), business (practices to products), leisure (procreation to recreation). Western and Eastern viewpoints. Personal creative development fostered by modeling and by investigation of proven techniques. A wide range of creative endeavor with an experiential approach. Future-oriented applications.

### 4053*
**Human Learning in Educational Psychology.** Prerequisites: 3113 or 3213 and an approved observation or field experience course. Instructional psychology focusing on the study of teaching and learning theory as part of an instructional program to deal with individual, cultural, and environmental differences. Case studies and group discussion emphasizing motivation, planning, evaluation, classroom problems and management.

### 4453
**Educational Diagnosis and Remediation.** Prerequisites: 4052, MATH 2413 and CIED 3283. Provides skills in the application of standardized and informal assessment information for educational planning. Includes analysis of commonly used achievement, perceptual, motor and language tests and behavioral analysis techniques.

### 4513
**Introduction to Emotionally Disturbed.** Prerequisite: 3202 or 5533. Characteristics, identification and teaching of the emotionally disturbed/behavior-disordered student; variety of theoretical approaches to the subject.

### 4613*
**Mental Retardation and Physical Handicaps.** Prerequisites: 3633. Nature, causes, and social consequences of mental retardation and physical handicaps.

### 4620
**Student Teaching in Special Education.** 1-12 credits, maximum 12. Prerequisites: admission to teacher education and 3202. Supervised teaching experience in the area of special education in which the student is preparing to qualify for a teaching certificate.

### 4643
**Student Teaching Methods.** Prerequisites: 4453, 4713, and concurrent enrollment in 4640. Competencies of classroom instruction, scope and sequence of activities, individualization of programs, appropriate teaching materials and communication skills in the education of handicapped individuals.

### 4653
**Education of the Mentally Retarded.** Prerequisites: 3202 and PSYCH 4613. Education program needs and social-cultural environment of mentally retarded children, adolescents and adults.

### 4773
**Individualizing Education Programs for Exceptional Individuals.** Prerequisite: 3202. Techniques for teaching individuals with handicapping conditions.

### 4782
**Curriculum and Methods for Teaching Mentally Retarded Adolescents and Adults.** Prerequisite: 3202. Techniques for teaching the mentally retarded individual from adolescence through adulthood.

### 4793
**Student Evaluation and Guidance Services.** For secondary school majors with emphasis on test design, use and grading practices and on the teacher role in testing, evaluation and guidance services.

### 4795
**Techniques of Behavior Management and Counseling with Exceptional Individuals.** Prerequisite: 3202. Techniques to develop and evaluate programs of behavior change for exceptional students including counseling with the exceptional individual and conferencing with professionals and parents.

### 5000*
**Masters Thesis.** 1-6 credits, maximum 6. Prerequisite: consent of instructor.

### 5013*
**Introduction to Graduate Study in Research in Education.** Required of all graduate students in education. An introduction to the concepts of research design, methodology, sampling techniques, internal and external validity, and the scientific method in educational problem solving. Critical analysis of educational research studies and the writing of proposals. No credit for student with credit in 5015.

### 5015*
**Foundations of Educational Research.** Introductory concepts in methodology, statistics and measurement necessary to research in education. Calculation and interpretation of descriptive statistics, introduction to inferential statistics, rudiments of educational research design and appropriate uses and characteristics of tests and measures. Emphasis on the scientific method in educational problem solving. No credit for students with credit in 5013 and 5952.

### 5023
**Introduction to School Psychological Service.** History, role and function, and issues and problems of the school psychological service worker.

### 5042
**Interviewing Techniques.** Prerequisite: graduate standing or consent of instructor. Basic principles underlying effective interviewing and interpersonal communication skills. Overview of various types of interviews. Application and analysis of interviews through video and audio tapes.

### 5063
**Introduction to Gifted and Talented Education.** Concepts, techniques and strategies for providing differentiated educational programs and experiences for the gifted and talented. State and Federal legislation; development of gifts and talent; program types; identification systems; program development; materials development; teaching techniques and methodologies.

### 5103
**Human Development in Psychology.** Introduction to basic psychodynamic, humanistic, structuralist, behavioristic, cognitive, emotional and social development. Applications to educational and family settings.

### 5123*
**Medical Information in Counseling.** Prerequisite: graduate standing or consent of instructor. Orientation to medical information and medical aspects of disability. Application to clinical problems in human service professions such as rehabilitation counseling, counseling psychology, and related disciplines.

### 5173
**Gerontological Counseling.** Prerequisite: graduate standing or consent of instructor. An examination of mental health treatment modalities and approaches to counseling with older adults. An experiential component is included.

### 5183
**Introduction to Rehabilitation Counseling.** Background, legal aspects and philosophy of rehabilitation. Overview of current practices in rehabilitation and related areas.
5213 Advanced Educational Psychology. Learning and its effect upon coping and adjustment. How learning, environmental and personality factors interact to change human behavior.

5223* Psychology of Disability. Psychological and sociological implications of physical disability and illness. Dynamics involved in adjusting to disabling conditions including issues in rehabilitation psychology, counseling, and somatopsychology.

5320 Seminar in Applied Behavioral Studies. 3-6 credits, maximum 6. Prerequisite: consent of instructor. In-depth exploration of contemporary problems of applied behavioral studies.

5363* Differentiated Curriculum Techniques and Materials for Gifted and Talented. Prerequisite: 5563. Development of curriculum content for horizontal and vertical enrichment and acceleration. Commercial and teacher-prepared materials in imagination, imagery, analysis; metaphor; inductive, deductive and abductive thinking; science; philosophy; psychology; logic systems; problem solving; concept learning; creativity; creative dramatics, etc. Conceptual approaches to the use of the preceding in various interest-based and non-interest-based formats.

5371* Educational Measurements. Appropriate applications of tests in the schools. Development of teacher-made tests, selection of standardized tests, interpretation of test results, understanding standard scores, reporting in testing literature, uses of test results and recent developments in educational measurement.

5382 Family-School Involvement Processes. For teachers, administrators, counselors, school psychologists and other school personnel concerned with improving communication between the home and school in an attempt to better meet the needs of children and youth.

5443* Theories and Problems in Educational Psychology. Theoretical foundations and nature of the problems studied in educational psychology; current issues and historical overview.

5453 Vocational and Career Information. Prerequisites: 5553 or 5572. Local, state and national sources of occupational information about jobs and occupational factors related to career planning and worker effectiveness.

5463* Psychology of Learning. Application to education of the principles and theories of the psychology of learning.

5473 Introduction to Counseling Practice. Prerequisite: consent of instructor. Orientation to counseling practice through observation and participation. The supervised experiences permit the student and the counselor education staff to evaluate the student's strengths and weaknesses as a potential counselor or student personnel administrator.

5483* Community Counseling and Resource Development. Prerequisite: 5562. Application of educational, preventive, and crisis intervention in a variety of human service settings, including the development and evaluation of community helping resources.

5503* Multicultural Counseling. Prerequisite: 5562. Emphasis on effective communication skills in cross-cultural counseling or helping relationships and the integration of theoretical knowledge with experimental learning. Psychosocial issues of various cultural and ethnic groups and their influence on the helping relationship.

5510* Psychology in Educational Psychology. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Supervised application of the principles and procedures of educational psychology in institutional settings appropriate to the preparation of students in the areas of their specialization.

5512* Secondary School Counseling and Development. Application of the school counselor, teacher, principals, and parents emphasized in organizing, developing, implementing, and evaluating a counseling and development program in secondary schools.

5530 Individual Appraisal. 3 credits, maximum 6. Methods of developing a framework for understanding individuals and techniques for data collection, assessment, and interpretation such as interviews, testing, and case study. The study of individual differences including ethnic, cultural, and gender factors.

5533* Developmental Interventions. Lab 2. Counseling theories and techniques for working with children, adolescents, and their parents in individual and group counseling and consulting. Laboratory portion translates theory to practice.

5543 Career Development Theories. Historical and contemporary viewpoints advanced by Ginsberg, Super, Holland and others. Theoretical and applied basis for developing school-based career education programs and for assisting individuals in career planning.

5553* Principles of Counseling. Provides a comprehensive foundation for counseling practice and emphasizes the application of contemporary theories to further knowledge of counseling as a communication process.

5563* Program Development in Special Education. Physical, social and psychological factors in communities such as power structure, economics, prejudice, religion, as well as practical and professional aspects that influence in establishing programs for the exceptional.

5572 Elementary School Counseling and Development. Counseling methods, group, individual, and small group situations; principles and techniques; group counseling, and the role of school counselors in developing programs in elementary schools.

5583 Group Process. Lab 2. Dynamics, theory and techniques applicable to working with people of all ages in various school and non-school settings. Group members' competencies are stressed during the laboratory period.

5590 Counseling Practicum. 3-12 credits, maximum 12. Prerequisites: 5523 or 5562 or 5572 or 5512 or equivalent and admission to the counseling or student personnel program. Supervised experience in human interaction processes of counseling and consulting with the major goal of facilitating positive growth processes through individual supervision. May be conducted in a variety of settings with a wide range of developmental levels.

5612* Methods of Teaching Students with Learning Disabilities. Prerequisites: 3202 or equivalent. Methods of preparing teachers in prescriptive techniques and individualized instruction. Procedures dealing with students who have specific learning problems; teaching/pupil-mate materials; setting up learning centers or a learning resource room; pupil motivation; cultural differences, and effective communication with other teachers, parents and administrators.

5615 Instructional Systems Design. A practically-oriented coverage of analyzing, defining, sequencing and validating instructional systems. Developing educational objectives, course development, matching instruction to individual differences and evaluation of systems. Techniques of developing and validating instructional components.

5620* Practicum with Exceptional Learners. 1-8 credits, maximum 8. Lab 1-8. Prerequisites: 5612 and consent of instructor. Supervised individual and group experience with exceptional learners. The particular experience (learning disability, mental retardation, gifted, etc.) is determined by the student's field of specialization.

5623* Introduction to Learning Disabilities. Prerequisite: survey course in special education. Problems that students experience during their preschool, school and adult years; historical and contemporary viewpoints on the cultural, environmental and psychophysiological contributions to learning style differences; and issues related to individualized educational planning and instruction. Practical experience with individuals having learning problems.

5631* History of Special Education. Historical background of special education and modern development; focus on the influence of historical, philosophical, cultural, and political factors on the development of special education.

5633 Behavior Characteristics of Exceptional Individuals. Individual differences and problems that exceptional individuals experience. Educational programs and resources available to assist administrators, teachers and parents in dealing with unique individual needs.

5643* Counseling Parents of Exceptional Children. Aiding the classroom teacher and other professional personnel in understanding of unique activities and interpersonal relations involved in counseling with parents of exceptional children.

5653* Play Therapy in Special Education. Theories and principles of play therapy. The application of play therapy for special education children. Supervised clinical experience with children with emotional, social and psychological problems.

5663* Creativity for Teachers. Theoretical origins of creativity and its concomitant applications in the learning environment. Blocks to creativity are explored through the principles of imagery, creativity testing, developing ideas and innovations, creative problem solving and teaching techniques and methods to maximize creative potential in all kinds and types of students.

5670* Rehabilitation Counseling Practicum. 1-12 credits, maximum 12. Prerequisites: graduate standing and consent of instructor. Applied experience for graduate students in counseling.

5673* Developmental Language for the Exceptional Individual. Prerequisites: 5302 or 5633; and SPATH 3460. Language development and variations from the norms demonstrated by handicapped learners. Theoretical approaches to language training, formal and informal assessment techniques, and instructional methods.

5680* Internship in Counseling. 1-12 credits, maximum 12. Prerequisites: 5590 and admission to the counseling and student personnel program. Supervised experience working and studying in a counseling agency or setting.

5693* Transpersonal Human Development. Human development in terms of individual consciousness, focusing on the implications of such extrascientific, transpersonal experiences as those associated with hallucinogenic drugs and mystical religious experience. Integration of psychological and religious interpretations of development. Applications to practical problems in education and psychology.

5720* Workship. 1-8 credits, maximum 15. Professional workshops of various topics and lengths. Each workshop designed to meet unique or special needs of individuals concerned with education, helping professions, and behavioral studies.

5732* Seminar in Education. Prerequisite: consent of instructor. Preparation of seminar study.

5735* Teaching Strategies for the Physically Handicapped. Prerequisite: 4613. Types of physical handicaps, their educational implications and various adjustments for optimal functioning.

5743* Curriculum Modifications for Exceptional Individuals. Materials and resources designed for use by teachers and other professionals, paraprofessionals and students in working with exceptional individuals. Includes commercial and teacher-student-made materials.

5763* Testing Methods and Techniques for the Gifted and Talented. Prerequisite: 5363. Subject and skill-related learning facilitation that is process-oriented and doing-centered. The role of the teacher as facilitator, coordinator and non-directing change agent. Individualized educational programs, including independent study, tutoring, correspondence, clustering, mentors, learning centers, resource centers.

5783* Psycho-educational Testing of Exceptional Students. Prerequisite: consent of instructor. Emphasis on understanding and design of individual tests, appropriate for exceptional individuals.
5823* Characteristics and Identification of Emotionally Disturbed Learners. Prerequisite: 5843. Characteristics and identification of the emotionally disturbed/behavior-disordered learner. Trains the teacher to identify the emotionally disturbed/behavior-disordered learner.

5853 Advanced Methods for Teaching the Mentally Retarded. Prerequisite: 4653. A review of research and methodological developments related to the instruction of mentally retarded children, adolescents, and adults.

5863* Developing Programs for the Gifted and Talented. Prerequisites: 5863 and 5863. Programs based on various philosophies and structural concepts of gifted and talented education, e.g., mainstreaming, self-contained, pullouts, magnet schools, single age grouping, and enrichment. Programs designed for general and specific academic ability; however, exposure will be provided to creative and productive thinking programs, leadership programs, and visual and performing arts programs. Specific models included.

5873 Instructional Strategies and Resources for the Emotionally Disturbed Learner. Prerequisite: 5823. The utilization of specific instructional strategies and resources available for working with the emotionally disturbed/behavior-disordered learner. A wide range of theoretical approaches explored.

5883 Behavior Management and Affective Education. Prerequisites: 4753, 5823. The utilization of strategies and procedures designed to the management of individual and group behavior. Affective education in a wide range of instructional settings.

5933 Altered States of Consciousness in Human Development. Theory and research concerning the role of altered states of consciousness in human development. Practical techniques for facilitating healthy human development which might be of use to counselors, teachers, and other human service workers. Techniques include guided imagery, progressive relaxation and especially, meditation.

5953 Elementary Statistical Methods in Education. Elementary statistical methods needed by consumers of educational research. Descriptive and inferential statistics. No credit for students with credit in 5015.

5962 Developing Support Resources for Gifted and Talented Students. Prerequisites: 5863. Development, management, and evaluation of volunteer programs in intra- and extra-class settings. Program types include parent-aid, volunteer-aid, mentors, tutors, group sponsors. Developing community interest, finding external resources, external funding and resource information sources.

5983 Intermediate Research Techniques in Education. Prerequisites: 5015 or 5013 and 5052. Selected techniques needed for effective research in education. Research design, data collection and analysis, and interpretation of results stressed. Appropriate utilization of nonparametric and factorial analysis of variance techniques.

5993 Identification and Behavior Characteristics of the Gifted and Talented. Prerequisites: 5733 and 5863. Cognitive, affective, and behavioral characteristics of the gifted and talented. Selection of tests and interest inventories. Selection and/or developing of nomination/recommendation forms/models, inventories, checklists, rating scales, sociograms as well as data abstraction from cumulative and anecdotal records. Functions of gifted/talented identification committees.


6013 Advanced Research Techniques in Education. Prerequisite: 5863. Research design, data collection and analysis, and interpretation of results stressed. Appropriate utilization of complex analysis of variance, multiple regression analysis, and related multivariate analysis techniques.

6043* Adult Development. Theory and research concerning human development during the adult years. Practical applications for serving adult populations in education and education-related settings.

6053 Professionalism and Ethics in Counseling Psychology. Principles and issues of professionalism and ethics. Legal and ethical implications derived from statutes and codes for the practice of counseling psychology in case studies.

6083 Principles of Counseling Psychology. Prerequisite: 5553 or equivalent. Development, theoretical foundations and applications of therapeutic models of counseling and psychology.

6110* Seminar in School Psychology. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Seminar oriented toward the assessment of psychological techniques applied to problems encountered in the internship.

6173 Higher Education Student Personnel Administration. Develops an understanding of the history, philosophy, student life, critical issues and administration of student personnel work in higher education.

6210 Internship in School Psychology. 3-6 credits, maximum 12. Prerequisite: enrolment in school psychology program. Supervised field experience in the duties of a school psychologist consisting of one semester participation under the direction of a certified school psychologist or other qualified field personnel approved by the supervising faculty member.

6213 Higher Education Student Personnel Services. Prerequisite: 6173. Higher education student personnel services such as: admissions, orientation, student activities, financial aid, housing and counseling.

6220 Internship in Higher Education Student Personnel. 2-6 credits, maximum 6. Prerequisites: 6173 or 6213 and admission to the student personnel and guidance program and consent of supervisor. Provides work and study opportunities under supervision in areas of student housing, student activities, financial aid, foreign student advisement, student personnel administration, student union, group facilitation and other appropriate work situations.

6310* Advanced Practicum and Supervision. 1-3 credits, maximum 12. Prerequisites: 5953 and master's degree. For prospective counseling psychologists, counselors, educational counselors and supervisors, and practicing counselors. Supervised assistance in development of counseling, consulting and supervising competencies.

6373 Program Evaluation. Prerequisites: 5013 or 5015. Content, purposes and techniques of evaluating educational programs. Evaluation design, information collection, analysis, writing and using reports and Costa for programs ranging from individual lessons to nation-wide multi-year projects. Special emphasis on evaluation requirements of federally funded programs.

6460 Internship in Educational Psychology. 1-9 credits, maximum 9. Prerequisite: consent of instructor. Supervision and guidance in teaching and service in educational psychology during the first semester of each new teaching assignment. Includes cooperative planning, project development, and evaluation.

6533 Human Motivation. A theoretically-oriented approach to the concept of motivation; essential precursors to human behavior and applications to the solution of real and hypothetical problems.

6553* Advanced Practice in Marital and Family Therapy. Prerequisites: 6523, concurrent enrollment in counseling or clinical practicum or consent of instructor. Advanced methods in assessment, diagnosis and treatment of marital and family problems. Special emphasis on ethical and professional practice.

6553* Advanced Practice in Marital and Family Therapy. Prerequisites: 6523, concurrent enrollment in counseling or clinical practicum or consent of instructor. Advanced methods in assessment, diagnosis and treatment of marital and family problems. Special emphasis on ethical and professional practice.

6560 Advanced Internship in Counseling. 1-3 credits, maximum 6. Prerequisite admission to the doctoral program in counseling and student personnel or applied behaviors, emphasizing counseling and development, and consent of instructor. Designed to facilitate counseling effectiveness and set the stage for a productive life of professional practice.

6603 Current Trends and Issues in Special Education. Current research and literature regarding the education of exceptional children.

6663 Applied Behavioral Studies Research Seminar. Prerequisite: admission to advanced graduate program. Critical analysis of current research.

6850 Directed Reading. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Directed reading for students with advanced graduate standing.

6880 Internship in Education. 1-8 credits, maximum 8. Prerequisites: admission to advanced graduate program and consent of department head. Directed off-campus experiences designed to relate ideas and concepts to problems encountered in the management of the school program.

ARCHITECTURE (ARCH)


2003 (HJ) Architecture and Society. Design, planning and building considered in their social and aesthetic contexts.

2100 Architectural Studies. 2-4 credits, maximum 4. Lab 1-2. Beginning studies in graphics and design in architecture.

2114 Statics and Strength of Materials. 2. Prerequisites: PHYSC 1114 or MATH 2265. Resultants of forces statics, statics equilibrium of rigid bodies and statics of structures. Shear and bending moments, deformation and displacements in deformable bodies.

2116 Architectural Design Studio II. 2. Prerequisite: grade of "C" or better in 1216. Problems in architectural design.

2183 (HJ) History and Theory of Architecture I. Prerequisite: 2003. History and theory of the Pre-Enlightenment era of architecture in the Western world.

2191 Architectural Design Studio III. 2. Prerequisite: grade of "C" or better in 2116. Problems in architectural design.

2263 Building Systems and Materials. Prerequisite: grade of "C" or better in 2116. Architectural, structural, environmental control systems and materials in architecture.

3100 Special Topics. 2-6 credits, maximum 6. Subjects to be selected by the faculty in architecture from advances in state-of-the-art areas.

3117 Architectural Design Studio IV. 2. Prerequisite: grade of "C" or better in 2263 and admission to third year. Problems in architectural design.

3123 Structures: Elementary Analysis. 2. Prerequisite: grade of "C" or better in 2114. Structural theory for applications in architecture.

3133 Environmental Control: Thermal Systems. Prerequisites: 2114 and 2116. A survey of the fundamentals of thermal comfort, energy concerns, and mechanical systems for buildings.

3233 Environmental Control: Electricity and Lighting. Prerequisites: PHYSC 1214 or 2114. A survey of electrical and lighting systems for buildings.
5133* Passive Design. Prerequisite: fourth-year standing. The principles of passive design strategies in architecture and application of these concepts in architectural design.

5144 Structures: Intermediate Concrete. Lab 3. Prerequisite: grade of "C" or better in 4123. Design and analysis of multi-story reinforced concrete frames and prestressed and post-stressed concrete structural components used in architecture applications.

5153* Advanced Architectural Acoustics Design. Prerequisite: fourth-year standing. Analysis and design of acoustically-critical spaces, including open-plan offices, music facilities, studios, theaters, etc. and a design project of the student's choice.

5193* Management of Architectural Practice. Prerequisite: fifth-year standing in architecture or architectural engineering or consent of instructor. Principles of management as applied to the private practice of architecture and architectural engineering.

5217 Architectural Design Studio VII. Lab 20. Prerequisite: grade of "C" or better in 5119. Problems in architectural design.

5223* Structures: Intermediate Analysis. Prerequisite: grade of "C" or better in 3123. Mathematical formulation of architectural structural behavior. Matrix applications, finite element, finite differences, stability considerations and three-dimensional structural modeling.

5233 Advanced Architectural Lighting Design. Prerequisite: fourth-year standing. Lighting applications in contemporary architectural design, including offices, schools, churches, health care facilities, etc. Principles applied to a design of student's choice.


5293 Architectural Project Management. Prerequisite: fifth-year standing in architecture or consent of instructor. Principles of management as applied to architectural and architectural engineering projects.

5370* Field Study in Europe II. 1-4 credits, maximum 8. Prerequisite: senior standing in architecture or consent of instructor. On-site analysis and study of European architecture, culture and urban design.

5000 Special Problems. 1-6 credits, maximum 6. Lab 3-18. Prerequisite: consent of instructor and head of the School. Thesis or research in related disciplines. Plan of study to be determined jointly by student and graduate faculty.

5083 Japanese Architecture. Prerequisite: admission to the professional School of Architecture or consent of instructor. Historical Japanese architecture from 200 BC to 1980. Shinto, Buddhist, Zen Sukiya, Zukuri, Minka and contemporary subjects.

5100 Special Topics. 3-6 credits, maximum 15. Subjects to be selected by the graduate faculty in Architecture to cover advances in the state-of-the-art.

5119 Architectural Design and Development. Lab 24. Prerequisites: for architectural engineering structures majors 3117, 3233, 3246, 3253; for architecture majors 3233, 3246, 3253, 4217. Design and detailed development of a major architectural project integrating all aspects of architecture and related disciplines in a professional manner and milieu.

5133* Passive Design. Prerequisite: fourth-year standing. The principles of passive design strategies in architecture and application of these concepts in architectural design.

5144 Structures: Intermediate Concrete. Lab 3. Prerequisite: grade of "C" or better in 4123. Design and analysis of multi-story reinforced concrete frames and prestressed and post-stressed concrete structural components used in architecture applications.

5153* Advanced Architectural Acoustics Design. Prerequisite: fourth-year standing. Analysis and design of acoustically-critical spaces, including open-plan offices, music facilities, studios, theaters, etc. and a design project of the student's choice.

5193* Management of Architectural Practice. Prerequisite: fifth-year standing in architecture or architectural engineering or consent of instructor. Principles of management as applied to the private practice of architecture and architectural engineering.

5217 Architectural Design Studio VII. Lab 20. Prerequisite: grade of "C" or better in 5119. Problems in architectural design.

5223* Structures: Intermediate Analysis. Prerequisite: grade of "C" or better in 3123. Mathematical formulation of architectural structural behavior. Matrix applications, finite element, finite differences, stability considerations and three-dimensional structural modeling.

5233 Advanced Architectural Lighting Design. Prerequisite: fourth-year standing. Lighting applications in contemporary architectural design, including offices, schools, churches, health care facilities, etc. Principles applied to a design of student's choice.


5293 Architectural Project Management. Prerequisite: fifth-year standing in architecture or consent of instructor. Principles of management as applied to architectural and architectural engineering projects.

5370* Field Study in Europe II. 1-4 credits, maximum 8. Prerequisite: senior standing in architecture or consent of instructor. On-site analysis and study of European architecture, culture and urban design.

5000 Special Problems. 1-6 credits, maximum 6. Lab 3-18. Prerequisite: consent of instructor and head of the School. Thesis or research in related disciplines. Plan of study to be determined jointly by student and graduate faculty.

5083 Japanese Architecture. Prerequisite: admission to the professional School of Architecture or consent of instructor. Historical Japanese architecture from 200 BC to 1980. Shinto, Buddhist, Zen Sukiya, Zukuri, Minka and contemporary subjects.

5100 Special Topics. 3-6 credits, maximum 15. Subjects to be selected by the graduate faculty in Architecture to cover advances in the state-of-the-art.

5119 Architectural Design and Development. Lab 24. Prerequisites: for architectural engineering structures majors 3117, 3233, 3246, 3253; for architecture majors 3233, 3246, 3253, 4217. Design and detailed development of a major architectural project integrating all aspects of architecture and related disciplines in a professional manner and milieu.
3100 Advanced Drawing. 3 credits, maximum 9 Lab. 6. Prerequisite: 2103. Investigation of drawing stressing thematic development, abstract ideas, and individual imagery.

3123 Oil Painting. Lab. 6. Prerequisites: 1103, 1113, 1203, 2203, 2213, 2603, 2613 or permission of instructor. The development of skills in oil painting stressing form and content, visual perception and individual expression. Technical instruction applicable to individual problems and needs.

3133 Watercolor Painting. Lab. 6. Prerequisites: 1103, 1113, 1203, 2203, 2213, 2603, 2613 or permission of instructor. Understanding and control of intaglio techniques; preparation, processing, and editioning of images from metal plates. Development of concepts and images through the medium of intaglio.

3163 History of Renaissance Art. 3 credits, maximum 9 Lab. Prerequisites: 3133, 3333. A broad-based course which allows students to pursue individual interests using a variety of materials and processes. Emphasis on visual control of a two-dimensional support: line, black and white, limited and full color. All media.

3263 History of Baroque Art. 3 credits, maximum 9 Lab. Prerequisites: 1103, 1113, 1203, 2203, 2213, 2603, 2613 or permission of instructor. Understanding and control of intaglio techniques; preparation, processing, and editioning of images from metal plates. Development of concepts and images through the medium of intaglio.

3313 Technical instruction applicable to individual problems

3333 Ceramics. 3 credits, maximum 9 Lab. Prerequisites: 1103, 1113, 1203, 2203, 2213, 2603, 2613 or consent of instructor. Understanding and control of intaglio techniques; preparation, processing, and editioning of images from metal plates. Development of concepts and images through the medium of intaglio.

4343 Language of Art Appreciation. Appreciation of art, music; use of specific art offerings available on campus.

Arts and Sciences (AS) 1103 (H,SpD) An Introduction to the Arts: Literature, Music and Painting. Formal relationships among painting, music and literature. An introduction to the several arts.

1111 Freshman Orientation. Orientation for freshmen. Study techniques, evaluation of one’s abilities and the making of proper educational and vocational choices.

4000 Special Studies in Art. 1-3 credits, maximum 9. Prerequisite: participation in the special study art program. Laboratory and workshop experience in one area: African, Asian, Latin American, Russian and Eastern European, Native American, Ancient and Medieval, Interdisciplinary studies (H,SpD) Language of Art Appreciation. Appreciation of art, music; use of specific art offerings available on campus.

3003 Colloquium in Area Studies, Interdisciplinary studies in one area: African, Asian, Latin American, Russian and Eastern European, Native American, Ancient and Medieval, or Women’s studies. Individual undergraduate research project.

3710 AS Internship. 1-6 credits, maximum 6. Prerequisite: junior standing. For students in the College of Arts & Sciences Honors Program. World history (cultural, political, and economic) since 1650; and seminar study of a selected global problem. Restricted to Honors students.
4000 Arts and Sciences Upper-division Honors Seminar. 1-3 credits, maximum 5. Prerequisite participation in the Arts and Sciences Honors Program

4110 Arts and Sciences Upper-division Honors Independent Study. 1-3 credits, maximum 3. Prerequisite: participation in the Arts and Sciences Honors program. Independent study by individual contract only. Before enrollment, student must have contract approved by the sponsoring professor and the director of Arts and Sciences Honors Program.

4910 Research Problems in the Arts and Sciences. 1-3 credits, maximum 9. Prerequisite consent of instructor. Directed readings and study for students wishing to pursue interdisciplinary topics of special interest in the arts and sciences.

4990 Honors Senior Thesis or Creative Activity. 1-3 credits, maximum 6. Undergraduate honors thesis, research and report, or other creative activity undertaken to satisfy the requirements for Departmental Honors in the College of Arts and Sciences. Restricted to Arts and Sciences Honors students.

5710 Developmental Workshop in Selected Academic Fields. 1-3 credits, maximum 9. Arts and Sciences discipline-based material. Study groups, lectures and seminars.


AVIATION AND SPACE EDUCATION (AVSED)


2023 (N)General Astronomy. Prerequisite: PHYS 1214 or equivalent. More rigorous treatment of material in 1104 for majors in physical sciences and other areas.

2153 Advanced Astronomy. Prerequisite: 1104 or 2023. Topics such as pulsars, quasars, neutron stars, black holes and interplanetary space probes.

3053 Astrophysics. Prerequisite: PHYS 2114 or consent of instructor. ASTRO 1104 recommended. Analysis and interpretation of astronomical phenomena in terms of the laws of physics: e.g. stellar structure, the interstellar medium, galaxies and cosmology.

3053 Celestial Mechanics. Prerequisite: MATH 2613. Motion of a particle under various laws of force, potential and attraction of massing bodies, theory of orbit determination and problems of two, three and N bodies.

ATHLETICS (ATHL)

1110 Intercollegiate Baseball and Softball. Lab 5. Development of knowledge and skills through participation in varsity competition.

1111 Intercollegiate Basketball. Lab 5. Development of knowledge and skills through participation in varsity competition.

1121 Intercollegiate Volleyball. Lab 5. Development of knowledge and skills through participation in varsity competition.

1131 Intercollegiate Football. Lab 5. Development of knowledge and skills through participation in varsity competition.

1141 Intercollegiate Swimming. Lab 5. Development of knowledge and skills through participation in varsity competition.

1151 Intercollegiate Golf. Lab 5. Development of knowledge and skills through participation in varsity competition.

1161 Intercollegiate Track and Field. Lab 5. Development of knowledge and skills through participation in varsity cross country, track and field competition.

1171 Intercollegiate Gymnastics. Lab 5. Development of knowledge and skills through participation in varsity competition.

1175 Intercollegiate Wrestling. Lab 5. Development of knowledge and skills through participation in varsity competition.

1191 Intercollegiate Tennis. Lab 5. Development of knowledge and skills through participation in varsity competition.

1201 Intercollegiate Field Hockey. Lab 5. Development of knowledge and skill through participation in varsity competition.

BIOCHEMISTRY (BIOCH)

3543 (N)General Biochemistry. Prerequisite: CHEM 2344 or 2463. Descriptive survey of the chemistry of living systems. A terminal course for students in applied biological sciences. Not recommended for preprofessional students or for students planning graduate work in biological science. No credit for students with credit in 3543.

3653 Survey of Biochemistry. Prerequisite: CHEM 3015 or 3053. An introduction to the chemistry of living systems. Chemical properties of the constituents of living organisms. Mode of formation, reactions and function of these compounds in microorganisms, plants and animals. No credit for students with credit in 3543.

4113 Aviation Safety. Prerequisites: 1113 and 50 credit hours. Overview of flight safety including studies in human factors, weather, aircraft crashworthiness, accident investigation, and aviation safety programs. Students will be introduced to elements of aviation safety in ground and flight operations.

4990 Special Problems. 1-5 credits, maximum 5. Lab 3-15. Training in independent work, study of relevant literature and experimental investigation of an assigned problem.

5000 Research. 1-6 credits, maximum 6. For M.S. thesis.
5853 Prerequisite: 5753 or 4113. Reaction Metabolism. 5753 or 4113. Reaction sequences and cycles in the enzymatic transformations of fats, proteins and carbohydrates; energy transfer, biosynthesis and integration in the metabolic pathways.

5930 Advanced Biochemical Techniques. 1-5 credits, maximum 5. Prerequisites: 5753 or concurrent registration, and consent of head of Department. Comprehensive lecture and laboratory course in advanced research techniques covering photometry, chromatography, isotopes, enzymes, macromolecules and metabolism. Offered in 5 consecutive parts in a semester. Any or all parts may be taken separately, each for one hour credit. Reduced credit for students with credit in 5823.

6000 Research. 1-15 credits, maximum 60. For Ph.D dissertation.

6110 Seminar. 1-2 credits, maximum 2 for Ph.D. candidates or 1 for M.S. candidates. Prerequisite: 5853. Graded on pass-fail basis.

6732 Biochemical Regulation. Prerequisite: 5853 or 4113. Mechanisms by which biochemical reactions, pathways and processes are controlled. Qualitative and quantitative behavior of various biochemical systems analyzed.

6742 Physical Biochemistry. Prerequisites: one semester of biochemistry, calculus and physical chemistry Physical principles underlying molecular phenomena of biology and methods for their study. Besides core of topics, additional items may be chosen for individual or group study.

6752 Enzymes: Kinetics and Mechanism. Prerequisite: 5753 or 4113. Theory of and methods for study of enzyme catalysis, including kinetics, chemical modification and manipulations, illustrated with examples from the current literature.

6762 Nucleic Acids and Protein Synthesis. Prerequisite: 5753 or 4113. The encoding of information into base sequences of nucleic acids and the expression of this information by means of protein synthesis. Structures, mechanisms, enzymatic synthesis and modification, reaction sequences, and control emphasized.

6772 Protein Structure. Prerequisite: 5753 or 4113. Protein structure (sequence, conformation, quaternary structure) illustrated by examples of selected proteins.

6792 Membranes and Transport. Prerequisite: 5853 or 4113. Components, organization and biosynthesis of cellular membranes, emphasizing structure/function relationship of plasma membranes. Mechanisms and energetics of transport of substances across various cellular membranes including plasma membranes and organelles.

6792 Plant Biochemistry. Prerequisites: 4113 or 5753. Biochemistry of processes and structures of special importance to plants, such as photosynthesis, cell walls, nitrogen fixation, secondary metabolites and storage proteins.

5733 Biochemical Principles. Prerequisite: CHEM 2153 or equivalent. Chemical and cellular constituents; introduction to the chemical processes in living systems. The first in a series of courses for graduate students in biochemistry and related fields.

5853 Biochemical Laboratory Methods. Lab 8. Prerequisites: 4113 or 5753, or concurrent enrollment in either, and CHEM 2113 and 2112, or 3224. Quantitative experiments illustrating biochemical principles and basic laboratory methods. No credit for students with credit in 5930.

5853* Botany. Prerequisite: 5753 or 4113. Reaction sequences and cycles in the enzymatic transformations of fats, proteins and carbohydrates; energy transfer, biosynthesis and integration in the metabolic pathways.

1114 (L, N, SpD) Introductory Biology: Populations and Ecosystems. Lab 2. Ecological principles, populations, man and environment; genetics, reproduction and development; concepts of evolution, selection, adaptation, speciation and taxonomy. For the nonmajor.

1214 (L, N, SpD) Introductory Biology: Organisms. Lab 2. Cellular organization and function, energy relations, maintenance of living systems, coordination and behavior. For the nonmajor.

1220 Current Topics in Biology. 2 credits, maximum 8. Topics of current interest especially designed for nonbiology majors.

122 (N) Human Reproduction. Human reproduction is dealt with in terms of anatomy, physiology, endocrinology, genetics and evolution. Birth control, and teratogenic substances as well as pregnancy and childbirth. For the nonbiology major.

1225 (N) Man and Environment. The impact of man's activities on the natural world and an analysis of the potential of technological and societal changes on the environment. For the nonbiology major.

1262 (N, SpD) Plants and Man. Types of plants, form and function, uses of plants by man, and impact of plants on society. For the nonbiology major.

1272 (N, SpD) Human Origins. The scientific evidence for the evolution of human morphology, technology, behavior and ecology. For the nonbiology major.

1304 (L, N) Principles of Biology. Lab 2. High school chemistry or one semester of college chemistry recommended. Unifying principles of cellular, organismal, population and ecosystem biology. Genetics, evolution, classification, development, energy transformations, integration and control in biological systems. The nature of biological investigation receives attention.

1403 (N) Plant Biology. Lab 3. Prerequisite: 1304. Survey of the plant phyla, structure and function of plant organs, water relations, translocation, reproduction, growth and development. Emphasis on the importance of plants to mankind.

1603 (N) Animal Biology. Lab 2. Prerequisite: 1304. Morphology, physiology, ecology, embryological development behavior, life histories and importance to man of representatives of major groups. Evolution of systems and mechanisms which have allowed animals to survive and adapt to diverse habitats.

3011 Cell and Molecular Biology. Lab 2. Prerequisites: 1403, or 1603, or equivalent; and organic chemistry. The cell concept and cell morphology, cell macromolecules, organelles, enzymes, energetics, movement of water and materials across membranes, influence of external environment, cellular synthesis, growth and maintenance, control and integration of function, replication, differentiation, origin and evolution of cells.

3024 General Genetics. Prerequisite: 1403, or 1603, or equivalent. Inheritance in plants, animals and microorganisms; molecular and classical aspects.

3034 (L) General Ecology. Lab 3. Prerequisite: 1403, 1603 or equivalent. Physical and biotic environment, responses of organisms to the environment, community ecology, natural ecosystems, and man's interaction with ecosystems.

4100 Problems and Special Study. 1-4 credits, maximum 4. Prerequisite: approval of instructor. Participation in research problems involving library, laboratory or field studies.

4313 Biophysics. Prerequisites: 1403, or 1603; PHYS 1214 or 2114; CHEM 3015. The application of physical concepts to biological structures and processes, interaction of light with biological materials, effects of radiation on living systems, electrical processes of biological systems, thermodynamics, nature of biological materials and the application of physical concepts in biological instrumentation. Same course as PHYS 4313.

5100 Recent Topics in Biology for Teachers. 1-4 credits, maximum 4. Prerequisite: approval of instructor. Acquaints the primary or secondary teacher with recent advances in biology. May include lecture, laboratory or field work.

5413 Developmental Biology. Prerequisites: 3014 or equivalent. The molecular basis of developmental events. Cell differentiation, intercellular communication and development as developmental mechanisms. Developmental aspects of carcinogenesis and teratology.

5800* Botany. Prerequisite: BISC 1114 or 1304 or equivalent. Collecting and identifying vascular plants including use of keys and terminology. Field recognition of native dominant Oklahoma plant and plant communities on sight, and discussion of the ecological factors that control them. For students in range management, wildlife ecology, animal science, forestry, and agronomy, and for non-scientists interested in learning the plants of Oklahoma. Three or four weekend field trips required.

5013* Biological Microtechnique. Lab 3. Prerequisite: BISC 1403 or 1603. Techniques for preparation of biological materials for microscopic examination. Same course as ZOOL 3013.

5024 Plant Diversity. Lab 4. Prerequisite: BISC 1403. Forms and life in plants, differentiation of cells, adaptations, and some of the less familiar forms. The diversity of plant forms as well as basic similarities in life histories; importance of each form to man and his environment. Field trips required.

3114 Plant Taxonomy. 4 credits. Prerequisites: BISC 1403 or equivalent. Vocabulary and concepts of plant taxonomy: terminology, keys, nomenclature, documentation, classification and biosystematics. Emphasis on angiosperm flora of Oklahoma. Field trips required.

3233 Plant Anatomy. Lab 3. Prerequisite: BISC 1403. Structure of cells, tissues and organs of plants. Consideration of structure as related to ontology, phylogeny and function.

3460 Plant Physiology Laboratory. 1-2 credits, maximum 1. Lab 2-4. Prerequisite: 3463 or concurrent enrollment. Students study techniques for working with plants, experiments involving nutrition, respiration, photosynthesis, water relations, translocation, hormones, growth and development. Students having credit in BISC 3014 should enroll for one hour; all others enroll for 2 hours credit.

3463* Plant Physiology. Prerequisite: BISC 1403. Plant subcellular structure, water relations, water absorption and movement of sap, transpiration, gas exchange, nutrition, enzymes, respiration, photosynthesis, growth, development, reproduction, tropisms, hormones, dormancy and seed germination.

3692* Plant Geography. Prerequisite: BISC 1403. Discussion of the natural geography of the world's plants and the factors controlling it, especially environmental and biological, with emphasis on evolutionary trends and events.
4023 Plant Ecology. Prerequisite: BISC 3034 or equivalent. Autecological principles applicable to higher plants including effects of specific environmental variants on plant processes and distributions.

4153 Plants of the Southern Rocky Mountains. Lab 6. Prerequisite: BISC 1403. Grasses and the principles involved in their classification. Field trips required.

4343 Agrostology. Lab 4. Prerequisite: BISC 1403. Grasses and the principles involved in their classification. Field trips required.

4400 Undergraduate Research. 1-2 credits, maximum 5. Prerequisite: consent of instructor. Undergraduate research problems in botany.

4533 Physiology of Ion Metabolism. Prerequisite: 3463 or BISC 3034 or equivalent. Consideration of plant subcellular organization and function, gene and enzyme nomenclature, cell life cycles, plant hormones, cell growth and growth control mechanisms, tropisms and phloem transport.

5753 Physiology of Growth and Development. Prerequisite: 3463 or equivalent. Consideration of plant subcellular organization and function, gene and enzyme nomenclature, cell life cycles, plant hormones, cell growth and growth control mechanisms, tropisms and phloem transport.

5763 Plant Tissue Culture. Lab 3. Prerequisite: 3463 or BISC 3034 or equivalent. Application of sterile technique, media preparation, embryogenesis and organogenesis. Survey of the major types of tissue culture and their application to crop and horticultural species. Introduction to general principles of genetic engineering of plant cells.

5813 Plant Developmental Genetics. Prerequisites: 3463 and BISC 3024 or equivalent. Discussion of morphogenetic patterns, fruit and seed development, the regulation of gene expression during plant development. Emphasis on recent genetic, experimental, and molecular studies of development in higher plants.

5823 Plant Morphology. Lab 3. Prerequisite: 3024. Comparative study of the form and life cycle of representative genera of the major taxa of vascular plants. Field trips required.

5850* Botany Seminar. 1 credit, maximum 6. Required of senior and graduate majors.

5923 Environmental Plant Physiology. Prerequisite: 3463 or equivalent. Effects of light, temperature, water, soil and other environmental factors on physiological responses of plants on their micro and macro environments, including responses to water stress, temperature stress, flowering, dormancy and germination.


BUSINESS ADMINISTRATION (BUSAD)

2010 Special Topics. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special topics and independent study in business.

4010 Business Projects. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special advanced topics, projects and independent study in business.

4050 Honors Colloquium. 3-9 credits, maximum 9. Prerequisite: senior standing. A program of special study and research for the doctoral dissertation. Independent study in any area of business.

4133 Small Business Management. Prerequisite: Business core courses or consent of instructor. Problems faced in the creation and early growth periods of business enterprises. Accounting, finance, opportunity recognition, legal constraints, management, marketing, taxation and procedural problems. To solidify the concepts covered, students are asked to create a plan for implementation and operation of a new business venture.

4513 Strategic Management and Business Policy. Prerequisites: senior standing and completion of common body core of the CBA. A terminal integrating course in formulating and implementing basic policy for business. Planning models, policy models and strategy development. Strategic decisions applied to practical examples of problems firms face, family of problems that they will face given current trends in the external environment.

5013 Research Methods for Business. Prerequisite: STAT 2023, admission to MBA program or approval from MBA director. Role of Bayesian and inferential statistics in business research and management decision making. Measurement, scaling, survey methods, and forecasting. These tools will be presented and reviewed in their applications to marketing; managerial, human resource, financial and, production planning; and other related business topics. Use of computers in statistical analysis.

5110 Computer Applications in Business. 3 credits, maximum 3. Prerequisite: admission to MBA program or approval from MBA director. Introduction to management information systems, statistical and optimization packages, financial modeling languages and microcomputers. Algorithmic programming in FORTRAN/ BASIC/COBOL.


5163 The External Environment of Business. Prerequisite: admission to MBA program or approval from MBA director. Social, ethical, regulatory and political forces as they impact on the organization. Attention to organizational response to these forces through management policies and strategies.

5713 Analysis of the Multinational Firm. Identification and analysis of the managerial, financial and market problems facing the multinational firm. Focus is empirical, and stress is on the application of ecological and quantitative tools to the study of the multidimensional nature of the international business environment.

5990 Graduate Research Projects. 3 credits, maximum 6. Prerequisite: graduate standing. Special problems associated with interpersonal and organizational communication affecting business decisions and operations. Principles and methods of basic and applied research in business and communication; practice in administrative report writing. Analysis of selected business cases.

6000 Research and Thesis. 3-9 credits, maximum 30. Prerequisite: approval of advisory committee.

6100 Seminar in Business Administration. 3-6 credits, maximum 6. Prerequisite: doctoral student status and consent of instructor. Interdisciplinary in nature; focused on research methodology.

BUSINESS COMMUNICATIONS (BCOMM)

3113 Written Communication. Prerequisite: 50 semester credit hours. Analysis of business communication problems in terms of generally accepted communication principles. Practice in written messages; especially, special goodwill letters, neutral and good news, disappointing, persuasive and employment messages.

3223 Organizational Communication. Prerequisite: 50 credit hours. Communication theory and process; common and special problems associated with interpersonal and organizational communication affecting business decisions and operations. Principles and methods of basic and applied research in business and communication; practice in administrative report writing. Analysis of selected business cases.

4523 Real Estate Law, Management and Practice. Prerequisite: 3213. Real property law and practice. Nature of real property; land descriptions; life information; conveyancing; listing and sales contracts; loans and mortgages; brokers and salesmen; landlord-tenant relations; condominiums, shopping centers. Successful completion qualifies persons to sit for Sales Associate State Licensing examination. Trusts and estates; matters involving estate planning, wills; law of descent and distribution; probate administration; gift and estate taxes; and fiduciary management of property.

5113 Seminar in Administrative Communication. Understanding and application of valid and relevant communication principles and theories. Designed to develop management-level personnel who can effectively and efficiently use oral and written communication as administrative tools to organizational functioning.
BUSINESS EDUCATION (BUSED)

5000 Thesis. 1-6 credits, maximum 6. Prerequisite: consent of department head.

5110 Problems in Business Education. 1-3 credits, maximum 6. Prerequisite: consent of department head, based upon the interests and needs of the students.

5330 Field Study. 1-6 credits, maximum 6. Prerequisite: consent of department head. Individual investigations conducted in absentia and internships; periodic conferences and reports during the progress of the study.

6000 Doctoral Thesis. 1-10 credits, maximum 10. Prerequisites: advanced graduate standing and approval of department head. Independent research for the doctoral thesis. Credit is given upon completion of the thesis.

6110 Graduate Reading in Business Education. 1-3 credits, maximum 6. Prerequisites: graduate standing and consent of supervising professor. Supervised reading of significant literature not included in regularly scheduled courses.

BUSINESS LAW (BUSL)

1113 Law in Society. Forms and types of law and their evolution, including antitrust, ecology, consumerism and civil rights. Political, social and economic forces affecting legal developments. Legal needs of society and the probable future direction of the law.

3213 Law of Contracts and Property. General concepts of jurisprudence; judicial systems; substantive law of torts, contracts, and property as they relate to the business environment.

3223 Theory of Commercial Transactions and Debtor-Creditor Relationships. Prerequisite: 3213. Concentrated study of law relating to certain commercial transactions and debtor/creditor relationships. Includes law of sales, negotiable instruments, secured transactions, suretyship and bankruptcy.

3422 Business Law. Prerequisite: 50 semester credit hours. Legal background, contracts, bailments, agency, sales, and negotiable instruments. Not open to students who have credit in 3213.

4113 Legal Environment of Business Organizations. Prerequisite: 3213. General principles of law relating to the formation, operation and termination of various forms of business organizations. Includes a study of the law of agency, partnerships and corporations.

4633 Legal Aspects of International Business Transactions. Prerequisites: 3213 or equivalent. Legal aspects of operating a business entity engaged in international commerce. Topics may include: foreign business organizations, U.S. taxation of foreign investors, common clauses in international contracts, problems of technology transfer on the international market, anti-trust aspects of international business, and jurisdictional problems in resolving disputes.

5163 Law of Business Environment. Prerequisite: 3213 or equivalent. Nature and source of law, the operation of the judicial system, the operation of administrative agencies, selected Constitutional provisions frequently involved in litigation of business problems, and selected substantive law areas having a direct relationship with business operation and decision making.

CHEMICAL ENGINEERING (CHENG)

2033 Introduction to Chemical Process Engineering. Lab 3. Prerequisite: CHEM 1515. Application of mathematics and scientific principles to solving chemical engineering problems. Simple material and energy balances applied to process design. The nature and application of unit operations and unit processes to the development of chemical processes.

3013 Rate Operations I. Lab 3. Prerequisites: 2033 and ENGS 3233. Basic rate equations for heat, mass and momentum transport; the transport analogies, solutions and correlations for predicting transport rates for practical applications; utilization in design and analysis of process equipment.

3113 Rate Operations II. Prerequisites: 3013, 3473. Continuation of CHENG 3013.


3473 Chemical Engineering Thermodynamics. Lab 3. Prerequisites: ENGS 2213; concurrent enrollment in 3030, and CHEM 3434. Application of thermodynamics to chemical process calculations. Behavior of fluids, including estimation of properties by generalized methods. Study of chemical thermodynamics, including heats of reaction, chemical reaction and phase equilibria.

4002 Chemical Engineering Laboratory I. Lab 6. Prerequisites: 3013 and 3473. Applications of heat, mass, and momentum transfer, unit processes, and unit operations pertaining to the analysis of bench and pilot-scale equipment. Interpretation of experimental data and the presentation of results are emphasized.

4113 Chemical Engineering Laboratory II. Lab 6. Prerequisite: 4002. A continuation of 4002.

4123 Chemical Engineering Design I. Prerequisites: 3113. Concurrent enrollment in 4002. Economic analysis of process plants and systems of equipment; methods for estimating plant investment requirements and operating costs; economic evaluation and optimal design of chemical process systems; basic equipment and process design calculations.

4223 Chemical Engineering Design II. Prerequisite: 4123. A continuation of CHENG 4213. Economic analysis of process plants and equipment. Design of chemical processing equipment and chemical plants. Application of computer techniques to chemical engineering design.


4363 Chemical Processes. Prerequisite: senior standing. Chemical process industries are studied from the standpoint of technology, raw materials, products and processing equipment. Thermodynamics and kinetics of industrial processes.

4473 Chemical Reaction Engineering. Lab 3. Prerequisite: senior standing. Principles of chemical kinetics rate concepts and data treatment. Elements of reactor design principles for homogeneous systems; introduction to heterogeneous systems.

4581 Seminar. Prerequisite: senior standing. Recent developments in chemical engineering and the process industries.

4613 Fundamentals of Refinery Engineering. Prerequisites: MATH 2613 and 3473 or MÆ 3613. Properties of porous media, properties and phase behavior of reservoir fluids and numerical methods, including numerical methods, for predicting and optimizing production rates and establishing reserves.

4683 Petroleum Processes. Prerequisite: 3473 Analysis of the unit processes of petroleum refining.

4840 Process Control Laboratory. 2-5 credits, maximum 5. Lab 4-9. Prerequisites: 3013 and MATH 2613. Experimental study of control loop performance including; process dynamics, sensors, feedback controllers, and control valves. Analog and digital techniques including pneumatic and electronic components, programmable controllers, and computer simulation with color graphics.

4843 Chemical Process Instrumentation and Control. Prerequisites: 3013 and MATH 2613. Instruments for measuring temperature, pressure, composition and other process variables; different modes of control and their influence on process stability. System analysis and design through linearization technique.

4990 Special Problems. 1-5 credits, maximum 5. Lab 3-15. Prerequisites: 3013 and MATH 2613. Training in independent work, study of relevant literature and experimental investigation of an assigned problem.

5000 Master’s Thesis. 1-6 credits, maximum 6. Prerequisite: approval of major professor. Methods used in research and thesis writing.
5030 Professional Practice. 2-6 credits, maximum 8. Prerequisites: senior standing and consent of instructor. Application of chemical engineering principles to the solution of real-life engineering problems in an actual or simulated industrial environment. Includes application of design and testing procedures, economic evaluation and reporting on one or more assigned projects.

5110 Special Topics In Chemical Engineering. Lab 2-6, 2-3 credits, maximum 8. Prerequisite: consent of instructor. Small group and individual projects in unit operations, unit processes, chemical kinetics, computer applications, process modeling or any of a wide range of chemical engineering topics. May be repeated for credit if subject varies.

5123 Advanced Chemical Reaction Engineering. Prerequisite: 4473. Advanced principles and applications of chemical kinetics in catalysis, heterogeneous systems, non-ideal reactions, polymerization and biological reactions.

5213* Selected Diffusional Unit Operations. Mass transfer in liquids and in diffusions in liquids and gases. Equilibrium stage and transfer unit concepts. Mass transfer concepts of diffusional unit operations such as absorption, adsorption, distillation, drying, humidification and liquid extraction.

5283 Biochemical Engineering. Prerequisite: consent of instructor. Application of fundamental biochemical engineering principles to challenges posed by biotechnology. Fermentation technology, biological mass transfer and kinetics, and bioprocessing design and scale-up.

5320 Introduction to Nuclear Engineering. 3-4 credits, maximum 4. Principles and application of nuclear energy. The fission reaction, the behavior of neutrons, nuclear reactor theory and nuclear reactors.

5423 Process Heat Transfer. Application of fundamental principles of single- and two-phase fluid dynamics and heat transfer to the design and analysis of process heat transfer equipment.


5533 Metallurgical Failure Analysis. Prerequisite: ENGSC 3313 or equivalent. Mechanisms which cause materials failure. Instrumentation used for failure analysis. Case history study of representative failures. Laboratory analysis of failed samples.

5583 Corrosion Engineering. Prerequisite: ENGSC 3313. Modern theory of corrosion and its applications in preventing or controlling corrosion damage economically and safely in service.


5743* Chemical Engineering Process Modeling. 3 credits, maximum 6. Chemical engineering system and process models. Analytical and numerical methods of solution of resulting equations or systems of equations, with computer methods in a chemical engineering context.

5793 Advance-Process Design and Economics. Prerequisites: 4123, 4223. Application of chemical engineering principles to the design and analysis of process equipment and plants; prediction and extrapolation of thermal and physical properties; methods for design and synthesis of process units and equipment.


5873 Air Pollution Control Engineering. Causes, effects and control of atmosphere pollution. Same course as CIVEN 5873.

5953 Petroleum Technology. Polymerization, catalytic cracking, reforming and other unit processes. Unit operations as applied to petroleum refining. Economics of refining operations.

5990* Special Problems. 2-4 credits, maximum 9. Prerequisite: consent of instructor. Individual report topics in chemical engineering involving operations, processes, equipment, experiments, literature search, theory, computer use or combinations of these.

6003 Doctoral Thesis. 2-15 credits, maximum 30. Prerequisite: approval of major professor. The doctoral candidate will register for a minimum of 3 semester credit hours to a maximum of 15 semester credit hours in each semester during which laboratory work is in progress. Methods used in research and thesis writing. An original investigation of a problem in chemical engineering and its report in a dissertation.

6010 Chemical Engineering Seminar. 1-3 credits, maximum 3. Advanced research and development topics.

6023* Chemical Engineering Science I. Prerequisites: 5213 and 5423. Theoretical aspects of fluid dynamics, heat transfer and mass transfer. Boundary layer theory, multiphase flow theory of diffusion and interphase mass transfer. Analogies between heat, mass and momentum transfer.

6113* Chemical Engineering Science II. Prerequisite: 6023. Continuation of 6023. Theoretical aspects of fluid dynamics, heat transfer and mass transfer. Boundary layer theory, multiphase flow. Theory of diffusion and interphase mass transfer. Analogies between heat, mass and momentum transfer.

6223* Advanced Chemical Engineering Thermodynamics. Prerequisite: 5843. Phase equilibrium in multicomponent systems. Irreversible processes, and the prediction of properties by statistical methods. Application of thermodynamics to unit operations.

6440* Advanced Topics in Chemical Engineering. 3-6 credits, maximum 9. Topics in chemical engineering unit operations in design. Advanced mathematical techniques in chemical engineering problems. May be repeated for credit if subject varies.

6543* Chemical Engineering Kinetics. Prerequisite: 6223. Kinetics of chemical reactions. Reaction rates in homogeneous systems. Design of batch and flow reactors, analysis and the design of gas-solid catalytic reactors.


1014 (L,N)Chemistry in Civilization. Lab 2. Symbols, methods and contributions to society of the chemical sciences. Includes polymers, pollution, energy, consumer chemicals, drugs, nuclear science and other topics. No credit for students with credit in 1025, 1215, 1314.

1214 (L,N)General Chemistry. Lab 2. The beginning chemistry course recommended for students in the applied biological sciences. No credit for students with credit in 1014, 1025, 1214.

1225 (L,N)General Chemistry. Lab 2. Prerequisite: 1215 or advanced placement. A continuation of general chemistry, recommended for students in the applied biological sciences. No credit for students with credit in 1415 or 1515.

1314 (L,N)General Chemistry. Lab 2. Prerequisite: MATH 1213 or one and one-half units of high school algebra. For students taking chemistry courses recommended for students in basic biological sciences (including premedical science and pre-veterinary science), physical sciences and engineering. No credit for students with credit in 1014, 1025, 1215.

1515 (L,N)General Chemistry. Lab 2. Prerequisite: 1314 or advanced placement. A continuation of general chemistry, no credit for students with credit in 1225.

2113 Principles of Analytical Chemistry. Prerequisites: 1515 or 1415, and MATH 1913 or 1715. Modern theories of solutions, separation techniques and methods of analysis. No credit for students with credit in 3324.

2122 Quantitative Analysis Laboratory. Lab 6. Prerequisite: 2113 or concurrent enrollment. Laboratory work related to material covered in CHEM 2113. No credit for students with credit in 3324.

2344 (N)Organic Chemistry. Prerequisite: 1025 or 1225 or equivalent. For students in agriculture taking 3-semester sequence 1025-2344-BIOCH 3543. Fundamentals of organic chemistry with an introduction to biologically important molecules. No credit for students with credit in 2443, 3015 or 3053.

3015* (N)Introductory Organic Chemistry. Lab 4. Prerequisite: 1415 or equivalent. Terminal course in organic chemistry covering general principles, methods of preparation, reactions and uses of both organic and cyclic compounds. No credit for students with credit in 2344, 2463, 3053 or 3112.

3053 Organic Chemistry. Prerequisite: 1515 or equivalent. Hydrocarbons and their derivatives, including specific compounds of theoretical, biological or industrial importance. No credit for students with credit in 2443, 2463 or 3015.

3112 Organic Chemistry Laboratory. Lab 6. Prerequisite: 3153 or concurrent enrollment. Laboratory exercises related to theoretical principles covered in CHEM 3053 and 3153. No credit for students with credit in 3015.

3153* Organic Chemistry. Prerequisite: 3053. A continuation of 3053.

3353 Introductory Quantitative Analysis. Prerequisite: 1225 or equivalent. Volumetric, gravimetric and instrumental methods of analysis. A terminal course in analytical chemistry. No credit for students with credit in 2113 or 2122.

3355 Descriptive Inorganic Chemistry. Prerequisite: 1225 or 1515. Structures and properties of the elements and their many compounds in the broadest sense which includes the modern technologically important materials, organometallics, and inorganic substances of biological significance.

3434* Physical Chemistry I. Prerequisites: 2113, MATH 2365. Introductory theoretical analysis of molecular structure, chemical bonding and macroscopic chemical systems using quantum theory, classical and statistical thermodynamics and kinetics. Students who are not chemistry majors may receive graduate credit. No credit for students with credit in 3334, 3532.

3532* Physico-Chemical Measurements. Lab 6. Prerequisite: 2122, 3434. Apparatus, experimental methods and calculations employed in physico-chemical investigations.

3553* Physical Chemistry II. Prerequisite: 3434. A continuation of 3434 Students who are not chemistry majors may receive graduate credit.

4024* Modern Methods of Chemical Analysis. Lab 6. Prerequisites: 2122, 3434. Theoretical and laboratory study of modern techniques, reagents and instruments employed in analytical chemistry.
Prerequisites: 3153 and Chemistry of High Polymers.


Inorganic Chemistry. Prerequisite: 3 hours of physical chemistry. Valence, periodic system, complex ions and the more important classes of inorganic compounds.

Chemical Literature and Reference Work. Prerequisites: 2113, and 3015 or 3053. Use of the chemical library; journals, reference works and other sources of information on chemical subjects.


5000. 1-6 credits. Maximum 6. Investigations, chiefly experimental, with necessary conferences. Familiarizes the student with methods used in research in chemistry.

Graduate Seminar. Preparation and presentation of seminars, usually on subjects of current interest taken from the literature. Completion of 1 credit hour required for M.S. degree.

Physical and Chemical Separations. Prerequisite: one year of physical chemistry Principles of bulk and multistage separation methods: chromatography, liquid-liquid extraction, zone melting, etc.

Equilibrium and Kinetics in Analytical Chemistry. Prerequisite one year of physical chemistry. Physical and chemical principles of equilibrium and kinetics as applied to analytical problems.

Modern Topics for Teachers. 1-6 credits, maximum 6. Prerequisite: teaching experience. Designed to help elementary and secondary science teachers improve their subject matter competence in chemistry. Content varies, depending on the needs of specific groups of teachers.

Chemistry of High Polymers. Prerequisites: 3153 and 3434 or equivalent. Preparation and polymerization of organic monomers; properties and uses of resulting high polymers; theories of polymerization; inorganic and natural organic polymers.

Radiochemistry. Prerequisites: 1515 and PHYSC 4213. Chemical aspects of nuclear reactions and reactors. Separation techniques: chemical effects of nuclear energy; isotope exchange and tracer applications.


Organic Reactions. Prerequisite: 5323. A continuation of 3153, covering more advanced material.


Mechanism and Structure in Organic Chemistry. Prerequisites: 3153 and 3553. Relationship of properties of organic compounds to their structure; mechanisms of organic reactions.

Statistical and classical thermodynamics applied to chemical systems.

Quantum Chemistry I. Prerequisite: 3553. Fundamentals of quantum mechanics, including classical mechanics, wave representation of matter, the Schroedinger equation and atomic structure

Solutions of Electrolytes. Prerequisite: 3553. Thermodynamics of solutions of electrolytes; cell potentials, transference conductance, diffusion, dielectric constants and their theoretical interpretation.


Research. 1-12 credits, maximum 55. Prerequisite: M.S. degree in chemistry or permission of instructor. Independent investigation under the direction and supervision of a major professor.

Advanced Seminar. Prerequisite: 5011 or M.S. degree. Preparation and oral presentation of critical reviews on chemical subjects. Usually related to the student's research area. Completion of 1 credit hour required for the Ph.D. degree.

Special Topics in Analytical Chemistry. 1-6 credits, maximum 6. Supervised study of topics and fields not otherwise covered.

Electroanalytical Chemistry. Prerequisite: 4024. The theory, practice and instrumentation in various areas of modern electroanalytical chemistry.

Analytical Spectroscopy. Prerequisite: 4024. Survey of selected topics in analytical applications of spectroscopic techniques. Fundamental concepts as well as current trends in research, including instrumentation.

Mechanism of Organic Reactions. Prerequisite: 5443. Theories of organic reactions; prediction of their course.

Heterocyclic Compounds and Medicinal Chemistry. Prerequisite: 5323. Preparations and reactions of cyclic organic compounds containing atoms other than carbon in the ring. Modern synthetic techniques as well as industrial methods for the preparation of heterocycles, especially those with medicinal properties and uses as related to structural characteristics of the compounds.

Chemistry of Natural Products. Prerequisite: 5323. Complex naturally occurring organic compounds such as alkaloids, terpenes and steroids.

Special Topics in Organic Chemistry. 1-9 credits, maximum 9. Prerequisite: 3153. Deals with topics not covered in other courses.

Chemical Kinetics. Prerequisite: 3553. The kinetics of chemical reactions and their theoretical interpretation.

Quantum Chemistry II. Prerequisite: 5623 or PHYSC 5623. Molecular quantum mechanics and chemical bonding.

Molecular Spectroscopy. Prerequisite: 5623. Spectra and structure of molecules.

Chemical Thermodynamics II. Prerequisite: 5563. A continuation of 5563.

Selected Topics in Advanced Physical and Inorganic Chemistry. 1-6 credits, maximum 12. Prerequisite: consent of instructor. Supervised study of selected topics and fields not otherwise covered.

Chinese (CHIN)

Elementary Chinese. Pronunciation, conversation, grammar and reading.

Intermediate Chinese I. Prerequisite: 1115 or equivalent proficiency. Reading, the writing system, culture, grammar, conversation.

Intermediate Chinese II. Prerequisite: 1115 and 2115 or equivalent proficiency. A continuation of 2115.

Chinese (CHIN)

Surveying I. Lab 3. Prerequisite: MATH 1613 or 1715. First course in a measurement science. Introduction and application of plane surveying procedures. Field problems related to linear and angular measurements, differential leveling, traverses and topographic surveys. Computer applications to surveying calculations.


Structural Analysis. Prerequisite: 3114. Analysis of interaction and stability of structures subjected to static loading. Beams, trusses, and framed structures are analyzed by appropriate classical methods. Classical methods and modern computer procedures for the analysis of statically indeterminate structures.

Structural Steel Design. Lab 3. Prerequisite: 3114. Introduction to the design of structural steel members and connections in accordance with AISC specifications.

Reinforced Concrete Design. Lab 3. Prerequisite: 3114. Introduction to the design of reinforced concrete elements in accordance with the strength design requirements of the ACI Building Code.

Surveying. Lab 3. Prerequisite: MATH 1613 or 1715. For students not majoring in civil engineering. Basic course in plane surveying techniques. Linear and angular measurements, traverses, differential leveling, horizontal and vertical curves and earthwork calculations.


Introduction to Geotechnical Engineering. Prerequisite: ENGSNG 2114. Physical and mechanical properties of soils, including: specific gravity, grain size distribution, plasticity, permeability, consolidation, and stability. Use of physical and mechanical properties to calculate stresses in a soil mass, lateral earth pressures, bearing capacity, and slope stability.

Environmental Engineering Science. Prerequisite: CHEM 1515. Engineering aspects of the life support system; the carbon-oxygen cycle; cycling of nitrogen, sulfur and phosphorus; the hydrologic cycle; toxicity and energy content of organic matter; composition of organic matter; hydrocarbons, carbohydrates, lipids; proteins, nucleic acids. Oxidizability and energy content of organic matter. Introduction to Biochemical Oxygen Demand (BOD); living organic matter as an engineering material.

Water and Society. How engineered water systems harness and modulate aspects of water development and the character of future societies.
3833 Hydraulics. Prerequisites: CHEM 1515, PHYS 2414. Basic principles of fluid flow and their application in civil engineering problems. Fundamental properties of water, water pressure and force, water flow in pipes and networks, water pumps, water flow in open channels, design of hydraulic structures, and design of urban drainage systems.

3843 Introduction to Hydrology I. Prerequisites: CHEM 1515, PHYS 2414, CIVEN 3833 or AGEN 3013. Basic principles of surface and groundwater hydrology and their application in engineering problems. Topics include the hydrologic cycle, weather and climate, precipitation, evaporation, soil moisture, evapotranspiration, sub-surface waters, stream flow hydraulics, hydrologic and hydraulic stream routing, prediction of flood events, application of hydraulic models. Same course as CIVEN 4313.

4010 Civil Engineering Research. 1-4 credits, maximum 12. Prerequisite: senior standing or consent of instructor. Research and investigation of civil engineering problems.

4042 Engineering Practice. Prerequisite: senior standing or consent of instructor. Topics of management and administration of civil engineering projects. Specific areas include contract management, quality control, bidding procedures, professional ethics, and professional liability. Also, advantages and disadvantages of professional registration and membership in professional organizations.

4273 Construction Planning and Scheduling. Lab 3. Prerequisites: senior or graduate standing. Critical-path methods of planning, scheduling and controlling construction projects. Includes both computer and noncomputer techniques.

4711 Basic Soils Testing Laboratory. Lab 3. Prerequisite: 3713. Laboratory measurement of the physical and mechanical properties of soils; specific gravity, grain size distribution, plasticity, compaction, compressibility, and shear strength.

4763 Construction Estimating. Lab 2. Prerequisite: senior standing. The construction industry, its makeup, operation, estimating and bidding procedures. Theory and practice of estimating materials, labor, equipment and overhead costs for various types of construction. Emphasis on labor and materials estimation during the conceptual design phase of a construction project.

4833 Unit Operations in Environmental Engineering. Prerequisites: 3813 and 3833. Basic theory of water and wastewater treatment unit operations.

5000 Masters Thesis or Report. 1-6 credits, maximum 6. Prerequisite: graduate standing. A student studying for a master's degree will enroll in this course for 2 credit hours if a report is to be written; 6 credits if a thesis is to be written.

5003 Computer-aided Design and Analysis. Prerequisite: senior or graduate standing. The simulation of civil engineering design and analysis processes for the application of digital computing methods.

5010 Civil Engineering Seminar. 1-3 credits, maximum 6. Prerequisite: graduate standing and approval of major professor. Review of literature of major fields of civil engineering.

5020 Civil Engineering Research. 1-6 credits, maximum 6. Prerequisite: graduate standing and approval of major professor. Research and investigations other than thesis studies.

5025 Engineering Practice. 1-6 credits, maximum 9. Prerequisite: approval of adviser. Professional supervised civil engineering practice involving authentic projects for which the student assumes a degree of professional responsibility. Activities must be approved in advance by the student's adviser and may consist of engineering experience on-campus or off-campus. Both periodic written reports and oral presentations are required as specified by the adviser.

5080 Engineering Problems. 1-3 credits, maximum 6. Prerequisite: graduate standing. Problems of particular interest to graduate students in the field of applied science.

5113 Advanced Strength of Materials. One- and two-dimensional problems in stress, deformation and instability by analytical methods.


5223 Systems Analysis for Civil Engineers. Prerequisite: senior or graduate standing. Synthesis of systems modeling, computer simulation techniques, mathematical optimization techniques, and evaluation tools of multi-attribute systems including utility theory and decision analysis. Mathematical optimization techniques in the areas of resource allocation, transportation and water resources, systems planning, structural design, construction management, and environmental and ecological problems.

5414* Classical Methods of Structural Analysis. Prerequisite: 3413. Advanced analysis of determinate frames, trusses, and arches by classical, numerical, and energy methods with emphasis on methods for hand computations.


5513 Advanced Reinforced Concrete Design. Prerequisite: 3523. Advanced topics in reinforced concrete design with emphasis on frames, slabs, and earthquake-resistant structures.

5523 Advanced Steel Structure Design. Prerequisite: 3513. Advanced topics in steel design such as plastic design, plated girders, composite design, fatigue and fracture, stability, and bracing design.


5543 Bridge Design. Prerequisites: 3513 and 3523. Structural design of steel and concrete highway bridges, including bridge types, parts of a bridge, loads, load distribution, analysis, design, and bridge rating. Emphasis on topics of special interest to students.


5623 Terrain Interpretation and Evaluation. Lab 3. Prerequisite: 3713 and GEOG 1114 or GS 2024. Engineering and environmental aspects of terrain and their reflection in topography, vegetation and man's use of surfaces. Characteristics of aerial photography and remote sensing imagery. Training and practice in the use of these media in applications and problems.


5643 Asphalt Materials. Lab 3. Prerequisite: graduate or senior standing. Composition of asphaltic materials and behavior of asphalt as a construction material. Introduction to the physical, chemical and rheological properties of asphalt that affect its durability under service conditions.


5663 Transportation Systems Analysis. Prerequisite: 3633. Determinants of demand for transportation and models for demand forecasting. Performance characteristics of transportation systems and models for performance. Quantitative analysis of multimodal transportation networks including prediction of flow patterns and service quality. Transportation systems and their potential social and economic impacts of transportation decisions. Application of systems analysis techniques to the evaluation and selection of alternative transportation systems.


5693 Pavement Design. Prerequisite: 3633. Basic principles and design methods of pavement design. Soils and pavement materials and their behavior under vehicle loads. Design of a pavement to support and spread vehicle loads to the supporting soils under all climatic conditions.

5703 Laboratory Testing of Soils. Lab 9. Prerequisites: 3713 and 4711. Testing soils for engineering purposes. Laboratory exercises in physical and mechanical properties of soils including: specific gravity, grain size distribution, plasticity, compaction, and shear strength.

5713 Rock Mechanics in Engineering Design and Construction. Prerequisite: adequate background in civil or architectural engineering or geology. Stress analysis, strength variations and deformational behavior of rocks. Engineer classification of rock. Methods of field and laboratory measurement of the engineering properties of rock. Rock mechanics concepts and problems in the design and construction of engineering works.

5753* Engineering Soil Stabilization. Prerequisite: 3713 and 4711. Theoretical and practical aspects of engineering soil stabilization as a method for improving and upgrading low quality and/or unstable soils for engineering purposes. Use of lime, portland cement, asphalt, sodium chloride and other physical/chemical admixtures. Conduct and evaluation of laboratory test methods and interpretation of test data. Necessary construction methods and procedures.

5763* Construction Equipment Management. Prerequisite: INDEN 3503. Concepts and theories of equipment operation and ownership costs and their relationship to production systems. Analysis of depreciation and other fixed costs for equipment pricing on construction projects. Application of engineering fundamentals to construction methods.

5773 Concrete Construction. Prerequisite: 4763. Design and analysis of formwork for concrete structures; economics of formwork designs. Concepts of slab construction as for parking areas, streets and highways; cost of mixing concrete, subgrade preparation, forms, finishing, sawing and curing.


5813* Environmental Laboratory Analysis. Lab 1. Prerequisite: 4833. Analytical procedures for water and waste water contaminants. Emphasis on the chemical theory of procedures, analytical work and an understanding of the significance or need for such laboratory data for surface and groundwater management and water and wastewater treatment processes and design.

5823* City Planning and City Organization. Lab 3. Prerequisite: senior or graduate standing. Orderly development and extension in city growth, civic, legal and engineering aspects: subdivisions, zoning, park system, water fronts, street systems, airports and transportation terminals, and traffic control. Functional organization of a city and city engineering organization.


5843* Hydrology I. Prerequisite: 3843. Study of the rate of exchange of water between phases of the hydrologic cycle and in particular of the variations in this rate with time and place.

5853* Fundamentals of Biochemistry and Microbiology for Environmental Engineering. Prerequisites: adequate background in chemistry and microbiology. Advanced treatment of microbiological and biochemical principles applied to environmental engineering analysis and design.

5863 Advanced Unit Operations in Environmental Engineering. Prerequisite: 4833. Theory and design of advanced physical-chemical water and wastewater treatment processes.

5873 Air Pollution Control Engineering. Causes, effects and control of atmospheric pollution.

5883 Solid Waste Management. Theory, design and operation of solid waste collection, disposal and reclaimation systems.


5923* Water Resources Planning and Management. Application of engineering economics and microeconomic theory to the planning and management of water-resources projects including flood control, hydroelectric, water supply, and urban stormwater. Systems analysis approaches, primarily linear and dynamic programming, and their application in water resources.

5933 Water Treatment. Prerequisite: 4833. Theory, design and operation of water treatment plants. Water treatment plant control procedures.

5943 Wastewater Treatment and Design. Lab 3. Prerequisite: 4833. Design of water and wastewater treatment systems.

5953 Biocological Waste Treatment Design. Lab 3. Prerequisite: 4833 or graduate standing. The use of laboratory and pilot plant studies in the design of biocological waste treatment plants. Various methods of scaling-up pilot plant studies to full-scale plants presented.

5963 Open Channel Flow. Prerequisite: 3833. Open channel hydraulics, energy and momentum concepts, resistance, flow channel controls and transitions, flow routing, and sediment transport.

5973 Ground Water Quality. Prerequisite: graduate standing. Consent of instructor. Ground water protection legislation. Fate and transport of nutrients, metals, other anions and cations, organics, bacteria and viruses in the subsurface environment. Pollution containment, abatement techniques. Aquifer restoration.

5983* Groundwater Pollution Control. Theory, design and operation of groundwater pollution control systems. Includes examples from site specific applications as well as regional or national focus.

6000 Ph.D. Research and Thesis. 1-16 credits, maximum 36 credits. Independent research under the direction of a member of the graduate faculty by students working beyond the level of Master of Science degree.

6010* Seminar. 1-6 credits, maximum 12. Prerequisite: consent of instructor. Analytical studies with suitable reports on problems in one or more of the subfields in civil engineering by students working beyond the level of Master of Science degree.


6413 Introduction to Plate and Shell Structures. Prerequisite: 5113. Bending of thin plate structures to include rectangular and circular plates. Analysis of orthotropic plates. Theory of plate bending and buckling. Introduction to shell bending theory.


6543* Plastic Steel Design. Plastic steel design in accordance with current specifications. Design of single and multistory frames. Limit analysis using energy methods of analysis.


6723* Advanced Geotechnical Engineering. Prerequisites: 5713 and 5743. Proportioning with soil or rock support of engineering projects. Application to projects such as tunnels, dams, transportation facilities and coastal or riverbank improvement works. Other topics include use of earth or rock as a construction material, natural slope stability, frost effects and earthquake design.

6733* Selected Topics in Geotechnical Engineering. Prerequisite: graduate standing in major area of geotechnical engineering, or consent of instructor. Recent developments in geotechnical engineering and selected geotechnical areas only briefly dealt with in prior courses.

6763 Construction Management. Prerequisites: 4273 and 4763. Management of the design and construction of civil engineering projects. Early project development and formulation, design coordination, preliminary and final estimates, project scheduling and cost analysis, packaging work, bid evaluations, bonds, insurance, and legal considerations.

6823* Environmental Concepts and Analysis II. Prerequisite: 5953. Advanced application of physical, chemical and biological principles in establishing quantitative relationships in control of the aqueous environment and in sanitary engineering analysis and design.

6853* Advanced Biological Waste Treatment Design. Prerequisite: 5953. Use of kinetic models in the design of biological wastewater treatment plants.

6863* Stochastic Methods in Hydrology. Prerequisite: 5843, or AGEN 4313 and STAT 4053 or equivalent. Stochastic and statistical hydrologic analyses of surface water and ground water systems. Analyses of urban and rural drainage, and detention systems. Same as AGEN 6313.


6913 Advanced Sanitary Science. Lab 3 Prerequisite: 5813. Effect and control of water pollutions.


6933* Operational Control of Wastewater Treatment Plants. Prerequisite: 5853 or consent of instructor. The use of scientific and engineering principles for the management of wastewater treatment facilities.
CLOTHING, TEXTILES AND MERCHANDISING (CTM)

1100 Clothing Construction; Processes and Products. 1-3 credits, maximum 6. Lab 1-4. A modular class including units on basic construction techniques, pattern selection and garment construction, selecting quality ready-to-wear, pattern alteration and fitting, costume techniques and problem fabrics, construction of designer garment, and managing a sewing laboratory mass production techniques.

2110 Fashion Showmanship. 1 credit, maximum 8. Prerequisites: 9 credit hours in clothing and textiles. Lab 4. Appreciation of art elements and design principles; development of skill in application of design within various segments of the clothing industry.

2433 Fashion Innovation and Marketing Processes. The process of fashion innovation; variables of fashion affecting present structure in the fashion industry. Development of present structure in the fashion industry. Production and distribution of consumer goods; process of fashion innovation; variables of fashion affecting present structure in the fashion industry.

3113 Flat Pattern Design. Lab 4. Prerequisites: 2573 or 5110. An analysis of the apparel and accessory needs of individuals, the structural properties of textiles and apparel industries and their external environments. Special emphasis on current issues and trends, forecasting, career contacts, and application of creative decision-making skills.

3301 Apparel Construction. Lab 2. Prerequisites: 5013. An analysis of the apparel and accessory needs of specialized market segments and the products designed to meet those needs, with consideration given both to product design and merchandising.

5101* Research Developments in CTM. 1-3 credits, maximum 3. Prerequisites: concurrent enrollment in NEC 5102. Application of research methods and investigation of current research developments in clothing, textiles and merchandising.

5232* Experimental Clothing. Lab 4. Prerequisites: 8 credit hours in clothing and textiles. Independent and creative study of current problems in clothing construction.

5273 Social and Cultural Aspects of Clothing. Prerequisite: 3991. The sociological, economic psychological and cultural aspects of dress.

5323* Textile Analysis. Lab 4. Prerequisites: 4572 and CHEM 2462. A study of methods applicable in the determination of certain physical and chemical characteristics of textile materials.

5383* Clothing, Textiles and Merchandising in Higher Education. Prerequisite: 9 credit hours in clothing, textiles and merchandising. Development and organization of curricula and teaching methods for clothing, textiles and merchandising.

5440* Clothing, Textiles, Merchandising Career Internship. 1-6 credits, maximum 6. Prerequisite: consent of instructor and department head. An individualized career-oriented internship. Selected learning experiences in approved work situations in the fashion industry or in selected educational or research activities related to clothing, textiles and merchandising.

5453* Textile Economics. Prerequisite: 9 credit hours of clothing, textiles and merchandising. Economic background of the industries and the industry with emphasis on production and distribution and current national and international problems.

5533 Functional Apparel: Theory and Design. Lab 4. Prerequisites: 5923, 4013, 5110. A holistic approach to the study of apparel design with an emphasis on integrating knowledge of the needs and functions of the individual, the structural properties of textiles and apparel design.

5663* Current Merchandising Trends and Practices. Prerequisite: 9 credit hours in fashion merchandising. Current trends in merchandising policies and procedures. Management level problems approached through in-store observations, activities and interaction with retail executives.

5810 Problems in Clothing, Textiles and Merchandising. 1-3 credits, maximum 6. Prerequisite: consent of instructor and department head. An individualized group investigation and discussion of special problems in the various phases of clothing, textiles and merchandising.


6000* Doctoral Thesis. 1-12 credits, maximum 30. Prerequisites: consent of major professor. Research in home economics for the Ph.D. degree under supervision of a graduate faculty member.


6133* Research Methods in Clothing, Textiles and Merchandising. Prerequisite: consent of instructor and department head. Application of research methods, experiences in research design and analysis of data.

6203* Theories of Dress and Communication. Appearance as a type of nonverbal communication related to consumer perception. Theoretical perspectives depicting the use of dress in communication.
COMPUTING AND INFORMATION SCIENCE (COMSC)

2113 (A) Computer Programming. Lab 2. Prerequisite: MATH 1513. Programming in a high-level programming language. Introduction to algorithms, problem-solving techniques, and structured programming. Examples of applications from various areas such as business, science or engineering.

2123 (A) Computer Science I. Prerequisite: 2113. Concurrent enrollment in MATH 2265. Non-numerical algorithms, string processing, programming style and documentation. Introduction to internal searching and sorting methods; linear linked lists.

2133 Computer Science II. Prerequisites: 2123 and 2311 or 2521. Description and implementation of non-numerical problems. The concept of an algorithm in narrative, symbolic and PDL form. Application of iterative and recursive algorithms and elementary data structures.

2203 Discrete Mathematics I. Prerequisite: MATH 1513 or 1715. Logic, set theory, proof techniques, probability and combinatorics, relations and functions, matrix algebra, graphs, Boolean algebra and lattices. Same course as MATH 2203.

2301 FORTRAN 77 Programming. Lab 2. Prerequisite: 2113. FORTRAN 77 control structures, arrays, subroutines, functions, input/output. A major programming assignment will be completed by each student enrolled in the course.

2311 PASCAL Programming. Lab 2. Prerequisite: 2113. PASCAL control structures, data structures, procedures, functions, recursive procedures, input/output.

2321 PL I Programming. Lab 2. Prerequisite: 2113. PL I control structures, data structures, procedures, functions, recursive procedures, based variables, input/output.


2360 Industrial Practice in Computer Science. 1-6 credits, maximum 12. Prerequisites: 3443, MATH 2965, junior standing, consent of departmental adviser. Applied computing in industry. Topics vary with cooperating employers. Written reports will be specified by adviser.

3113 Computer Organization. Lab 2. Prerequisite: 2123. Description of computer systems or subsystems from the viewpoint of elementary logic functions and logic devices. Number representations for arithmetic operations. Interconnection of computer functional units. Control and organization of functional units; memory, processor, input/output and control. Same course as ECE 3223.

3203 Discrete Mathematics II. Prerequisite: MATH 2203 or 3113. A continuation of COMSC 2203; algebraic structures, state machines, machine decomposition, computability, formal language theory. Same course as MATH 3203.

3213 Microcomputer Principles and Applications. Lab 2. Prerequisite: junior standing or above. Introductory microcomputer theory. Design of microcomputer systems, design of microcomputer systems, memory components and organization. Microprocessor and microcomputer system architecture, assembly language programming, interfacing techniques. Same course as ECE 3213.

3223 Numerical Methods for Digital Computers. Prerequisite: MATH 1223, MATH 3013, knowledge of FORTRAN. Digital computer approximate solutions of algebraic and transcendental equations, solutions of linear and non-linear equations, functional approximations, least squares curvefitting and applied topics. Practical programming experience in applications of these techniques.

3201 ADA Programming. Lab 2. Prerequisites: 2123. ADA-R control structures, data structures, subprograms, types, parallel processing, exception conditions.

3311 MODULA-2 Programming. Lab 2. Prerequisites: 2123 and 2301 or 2311. MODULA-A control structures, data structures, types, procedures, functions, modules, concurrent processes, coroutines.

3241 APL Programming. Lab 2. Prerequisites: 2123. APL symbolism, scalar, vector and array operations, functions, procedures.

3311 ALGOL 68 Programming. Lab 2. Prerequisite: 3333. ALGOL programming in the algorithmic language ALGOL 68. Simple modes, user defined modes, looping units, routines and procedures, transput.

3401 VAX Assembler. Lab 2. Prerequisite: 2123. VAX assembler instructions, addressing modes, macros, pseudo instruction, control and data registers, register conventions, virtual memory concepts.

3411 IBM Assembler. Lab 2. Prerequisite: 2123. IBM assembler instructions, addressing modes, macros, pseudo instruction, control and data register conventions, virtual memory concepts.

3421 PERKIN ELMER Assembler. Lab 2. Prerequisite: 2123. PERKIN ELMER assembler instructions, addressing modes, macros, pseudo instruction, control and data registers, register conventions, writable control store.

3431 The C Programming Language. Lab 2. Prerequisite: 2123. C programming language types, operators, expressions, control flow, functions, structures, pointers, arrays, UNIX interface.

4424 UNIX Programming. Lab 2. Prerequisite: 2123. UNIX knowledge. UNIX file system and the shell. Use of pipes and filters.

3883 Special Topics in Computing Sciences. Prerequisites: junior standing, 9 credit hours COMSC, ENGL 3923, or concurrent enrollment. Social implications of computer use or misuse with emphasis on the effects on the individual, society and other human institutions. Social responsibilities of people involved in using or applying computers.

4110 Techniques of Computer Science for Science and Engineering. Prerequisite: one year of calculus and senior or graduate standing. For graduate and advanced undergraduate students requiring a one-semester treatment of computing topics. No background in computing topics assumed. Comprehensive treatment of the FORTRAN programming language with emphasis on numerical applications. Number systems, finite arithmetic, iterative processes, program structuring, numerical methods, program libraries are covered. No credit for students with credit in 2113 or 2123.

4143 Computer Graphics. Prerequisites: 3333, MATH 2265. Interactive graphics programming; graphics hardware; geometric transformation; data structures for graphic representations; viewing in three dimensions; representation of 3D shapes; hidden edge and hidden surface removal algorithms; shading models.

4223 Management Information Systems. Prerequisites: 2123, 2203. The design and operation of management information systems. The total systems concept, real-time systems and current development in management information theory.

4253 Numerical Mathematics. Analysis. Prerequisites: MATH 2613, MATH 3013, knowledge of FORTRAN. Computer arithmetic and rounding errors; numerical methods and error analysis associated with interpolation, least squares, numerical integration, iterative and direct methods, finite differences and ordinary differential equations, systems of linear algebraic equations. Same course as MATH 4253.

4273 Software Engineering. Lab 2. Prerequisites: 2133, 3443 or ECE 3213. Principles underlying software design methodology. Standards for software design. Design decisions. Design of small software design literature. Solution of a large scale software design problem in a simulated working environment. Same course as ECE 4273.

4323 Operating Systems I. Lab 2. Prerequisite: 3443, STAT 2013. Dynamic procedure activation, system structure, system measurement and evaluation, management, process management, automatic and manual system recovery procedures.

4334 Data Structures and Information Processing. Lab 2. Prerequisite: 2133. Storage, structures, data and information management and number representation. Run time behavior of programs. Language definition structure, control structures and data flow. Examples from ALGOL 60, ALGOL 68, APL, SNOBOL 4, LISP and FORTRAN.

4363 Organization of Programming Languages. Prerequisites: 3113, 3203. Programming language constructs. Introduction to file processing operations and auxiliary storage devices. Programming assignments are implemented in assembly language.

4351 UNIX Programming. Lab 2. Prerequisite: 2123. The UNIX programming system. The programming environment. The UNIX file system and the shell. Use of pipes and filters.

4444 Compiler Writing I. Lab 2. Prerequisite: 3443. Syntax and semantics of procedure-oriented languages and the theory of translation techniques used in their compilation. Study of languages for particular application areas, including nonalgebraic languages.

4570 Special Topics in Computing. 1-3 credits, maximum 5. Advanced topics and applications of computer science. Typical topics include operating systems, multithreading techniques, programming languages or other topics of current interest; computer-aided design, alternative operative and no feasible solutions. Revised simple procedures. Duality theory, economic interpretations, dual simplexing and complementary pivoting. Sensitivity analysis and parametric programming Special cases of linear optimization problems and underlying mathe-
5070 Seminar and Special Problems. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Designed to allow students to study advanced topics not provided in existing courses.

5113 Computer Organization and Architecture. Prerequisite: 3443. Computer architecture, computer control, microprogrammed control, addressing structures, memory hierarchies, hardware description languages, specific architectures, hardware simulation, emulation.

5154* Computer Science Migration. Lab 2. Prerequisite: graduate standing. A survey of computer science for students whose undergraduate major was not computer science. Programming in high-level languages. Programming in assembly language. Algorithm design and analysis. Computer system fundamentals. Fundamental data structures.

5253* Digital Computer Design. Prerequisite: ECEN 3223. Analysis and design of digital computers. Arithmetic algorithms and the design of the arithmetic/logic unit (ALU). Serial and parallel data processing; control and timing systems; microprogramming; memory organization on alternatives; input/output interfaces. Same course as ECEN 5253.


5333 Compiler Writing II. Prerequisite: 4444. Continuation of 4444. Theory and practice of compiler writing techniques and computer compiler construction. A formal approach to compiler languages.

5413* Data and Storage Structures. Prerequisite: 4344. Data structures and their application in recursive and iterative algorithms. Static and dynamic data structure representations and processing algorithms. Dynamic and virtual storage management.

5423 Information Organization and Retrieval. Prerequisites: 4344, 4424. Storage, classification and retrieval of information, data bases, errors, multi-key files, indexing; databases of files reorganization, search strategies.

5513 Numerical Analysis I. Prerequisite: 4253 or MATH 4253. Algorithms and error analysis; solutions of equations; interpolation and approximation theory. Same course as MATH 5513.

5543 Numerical Analysis II. Prerequisites: 4253 or MATH 4253 and MATH 4563. Discrete variable methods in ordinary differential equations including single-step and multistep methods. Iterative techniques for numerical solution of partial differential equations. Same course as MATH 5543.

5553* Numerical Analysis III. Prerequisites: MATH 3013, COMSC 4253 or MATH 4253. Theoretical and computational methods associated with matrix algebra, linear algebraic equation and eigenvalue problems. Same course as MATH 5553.

5563 Automata and Finite State Machines. Prerequisites: 5313 or 5113 and 5213 or MATH 3113. Finite state model, state diagrams and flow tables, equivalent states and equivalent machines. Formal grammars, context-free languages and their relation to automata. Turing machines, computability and recursive function. Same course as MATH 5563.

5663 Computability and Decidability. Effectiveness, primitive recursion, general recursion, recursive functions, equivalence of computability, definitions, decidability, and recursive algorithms. Same course as MATH 5663.

5710 Computer Operations. Prerequisites: graduate standing in computer science and consent of instructor. Experience in the operation of computers and peripheral equipment.

5900 Research and Thesis. 2-15 credits, maximum 30. Prerequisites: graduate standing and approval of advisory committee. Independent research under the direction of a member of the graduate faculty. For students working toward a Ph.D. degree.

6023* Nonlinear Programming. Prerequisite: 5013; FORTRAN. Theoretical and practical aspects of nonlinear optimization. Development and application of optimization techniques used for unconstrained and constrained problems; sequential search procedures, gradient methods, Newton methods and conjugate directions. Lagrange methods, quadratic programming, geometric programming, penalty and barrier methods and projection methods. Same course as MATH 5623.

6340 Advanced Topics in Computer Organization. 2-6 credits, maximum 12. Prerequisite: 5113 and 5253. Structure and organization of advanced computer systems, parallel and pipeline computers, methods of computation, alignment networks, conflict-free memories, bounds on computation time.

6350 Advanced Topics in Computer Architecture. Prerequisites: 5253 or ECEN 5253. Innovations in the architecture and organization of computers, with an emphasis on parallelism. Topics may include pipelining, multiprocessors, data flow, and reduction machines. Same course as ECEN 6253.

6350 Advanced Topics in Operating Systems. 2-6 credits, maximum 12. Prerequisite: 5313. Interpreter models of programming language semantics, Vienna definition language, lambda calculus, LISP definition, Knuth semantic systems and their formulation, translation and denotational semantics. May be repeated with change of topics.

6350 Advanced Topics in Operating Systems. 2-6 credits, maximum 12. Prerequisite: 5323. Design and analysis of operating systems. Concurrent processes, server scheduling, models of auxiliary storage, memory management, virtual systems, performance algorithms. May be repeated with a change in topics.

6400* Advanced Topics in Information Systems. 2-6 credits, maximum 12. Prerequisites: 5413, 5423. Design and analysis of data bases and other information systems. Hierarchical, network, and relational systems; implementation of data base systems; update and retrieval algorithms; multi-user and security access mechanisms; distributed data base systems. May be repeated with change of topics.


6600* Advanced Topics in Analysis of Algorithms. 2-6 credits, maximum 12. Prerequisite: 5413. Analysis of various algorithms. Sorting, searching, computational complexity, lower bounds for algorithms; NP-hard and NP-complete problems; parallel algorithms; proof of correctness of algorithms. May be repeated with change of topics.

6623 Algebraic Structures of Formal Grammars. Prerequisites: 5313, 5653. Context-free languages, Kleene languages, Dyck languages, context-sensitive languages; use of algebraic systems to define languages; linear bounded automata.

CONSTRUCTION MANAGEMENT TECHNOLOGY (CONST)

1213 Introduction to Building Construction. Lab 3. Fundamentals of light building construction; techniques of architectural drafting used in the development of plans, elevations, sections, details and construction drawings and interpretation.

1333 Construction Practice. Prerequisite: departmental approval. Supervised field experiences in construction between the freshman and senior years, emphasizing the wide variety of layout, concrete placement framing and finish techniques employed.

2252 Drawing Interpretation for Heavy Construction. Prerequisites: 1213 and 2334. Interpretation of construction drawings for heavy construction projects including civil and structural together with fabrication drawing and submittal data review.

2253 Interpretation of Building Construction Drawings. Lab 3. Prerequisites: 1213 and 2334. Interpretation of residential and commercial construction drawings including architectural, civil, structural, mechanical and electrical. Fabrication drawing and submittal data review.

2334 Materials and Methods of Construction. Structural and finish materials used in architectural construction, their properties, manufacture and applications. Light, heavy and industrial construction. Foundation layout, framing and finish work, site investigations, excavation, precast concrete, tilt up, structural steel and metal building construction and project management.


2623 Estimating I. Prerequisite: 2252 or 2253. Quantity takeoff with emphasis on excavation, formwork and concrete, masonry, rough carpentry and miscellaneous specialty items.

3345 Mechanical Principles. Lab 6. Designed to present mechanical concepts to nonmechanical students entering the Electrical Power program. Covers basic material science and principles of statics.

3353 Structures for Electrical Power. Lab 3. Prerequisite: 3345. Analysis of the behavior of structures used in the electrical power industry; structural design, behavior and failure of materials; foundation, types of structures and erection procedures.

3363 Timber and Form Design. Lab 3. Prerequisite: MECTD 3323. Basic timber structures with emphasis on concrete form applications.

3452 Mechanical Equipment of Buildings. Prerequisite: PHYS 1114. Mechanical equipment of buildings and heating and air conditioning systems as applied to residences and commercial buildings.

3462 Electrical Equipment of Buildings. Prerequisite: PHYS 1214. Electrical and lighting systems as applied to residences and commercial buildings.


3563 Construction Law and Insurance. Legal and insurance problems as they pertain to the construction industry.

3663 Concrete Design. Lab 3. Prerequisite: MECTD 3323. Analysis and design of reinforced and prestressed concrete in accordance with the ACI building code.
4363 Design and Management of the Elementary School Curriculum. Prerequisites: ABSED 3113, FRCD 3293, or consent of instructor. Design and management of the physical, social, intellectual, cultural, and learning needs, and learning materials aspects of the school classroom, kindergarten through grade 6. Purposes, selection, and organization of classroom management systems and teaching approaches.

4450 Internship in Elementary Education. Lab 3-36, 1-12 credits, maximum 12. Prerequisites: 3450 and full admission to Teacher Education. Advanced clinical experience as associate (student) teacher in schools, kindergarten through grade eight.

4460 Kindergarten: Primary Education: Methods. 2 credits, maximum 3. Prerequisite: admission to Teacher Education. Purposes, methods of teaching, classroom design and management, classroom routine, and selection and organization of content in kindergarten- primary education.

4473* Reading for the Secondary Teacher. Prerequisite: concurrent enrollment in 3710. Materials and procedures in the teaching of reading in secondary schools for content area teachers.

4560 Outdoor Education Competencies. 1-4 credits, maximum 4. Lab 1. Prerequisite: 2113 or LEIS 2413. Development of (teacher/leader) competencies in the content, methods, philosophy, and historical perspective of contemporary curricula using the out-of-doors as a multidisciplinary learning laboratory.

4703 Computer Applications in the Middle School Science Curriculum. Prerequisite: 3132 or consent of instructor. Principles and techniques related to using microcomputer technology in teaching middle school science, microcomputer interfacing, simulation, and interactive videodisk.

4713 Methods and Materials in the Secondary School I. Prerequisite: admission to Teacher Education. Purposes, selection and organization of content, teaching and learning procedures, and evaluation of outcomes in grades 7-12 appropriate for the discipline in which the student intends to qualify for teaching certification. Recommended to be taken concurrently with 3710. Available to students in discipline-specialized sections: art, foreign languages, health and physical education, journalism, language arts, mathematics, science, social studies, speech/drama.

4720 Internship in the Secondary Schools. Lab 3-36, 1-12 credits, maximum 12. Prerequisite: admission to Teacher Education, 2113, 3710, ABSED 3113 or 3213. 4723. Supervised observation and student teaching in fields in which the student intends to qualify for teaching certification. Develops awareness of and provides experience with mental, social, physical, and cultural differences among adolescents.

4750 Methods and Materials in the Secondary School II. Prerequisites: 4713 or equivalent, verification of student teaching internship placement. Continuation of 4713 or equivalent specialized methods course. Taken concurrently with the student teaching internship experience in grades 7-12. Available to students in discipline-specialized sections: art, foreign languages, health and physical education, journalism, language arts, mathematics, science, social studies, speech/drama.

4730 Methods and Materials in the Schools, K-12. 1-3 credits, maximum 3 Prerequisites: 4713 or equivalent, verification of student teaching internship placement. Continuation of 4713 or equivalent specialized methods course. Taken concurrently with the student teaching internship experience in grades K-12. Available to students in discipline-specialized sections: art, foreign languages, health and physical education.

4913 International Problems and the Role of the School. Prerequisite: junior or senior standing. Extends the student's intercultural awareness by focusing on international problems and expanding their meaning to include the school and its relationship to existing international concerns in other types of societies. Consideration of such international problems as natural resources, environment, food supply, urbanization and conflict resolution.

5000 Masters Report or Thesis. 1-6 credits, maximum 6. Prerequisite: consent of adviser. Students studying for a master's degree enroll in this course for a total of 2 credit hours if they write a report or 6 hours if they write a thesis.

5023* Comparative Education. A systematic investigation of educational institutions in various nations for the purpose of an enlarged, critical view of American education.

5033* Teaching Foreign Languages in the Schools. Prerequisite: full admission to Teacher Education. Curriculum, materials, methods and procedures related to foreign languages (grades K-12).

5043* Fundamentals of Teaching. Prerequisite: ABSED 5213 or 5463. Theory and research on teaching applied to classroom teaching behavior.

5053* Fundamentals of Curriculum Development. A study of curriculum that includes philosophy, history, decision making, major concepts and terms.

5103* Advanced Computing Applications in Education. Lab 0-2. Prerequisite: 4043 or equivalent. Includes educational applications involving authoring systems, data-base management, software interfacing, and non-instructional uses within the school environment. Impact of current issues on instructional computing.

5113* Videotape Television for Instruction. Prerequisite: 4113. Educational design and production of videotape using single camera, studio production and other technology. Individual and team projects.


5130* Advanced Studies in Childrens Literature. 1-3 credits, maximum 6. Prerequisite: 4023. The history of children's books against a world background of prevailing economic and social factors influencing cultural patterns and values. The tools of research in children's literature and the nature and direction of contemporary children's book publishing in the United States and abroad.

5133* Photography for Instruction. Prerequisite: 3122. Photography skills emphasizing 35mm and Instamatic type cameras with application to instruction and other communication situations such as photo-copying, use of high-contrast film for graphics, and simple photography projects for school-age students.

5143* Language Arts in the Curriculum. Content and current issues in the language arts. Materials and methods for teaching the communication skills.

5153* Computer-Based Instruction Development, Lab 0-2. Prerequisite: 4043 or equivalent. Examinations of curriculum strategies, related research issues, and techniques for developing computer-based instruction. Students will develop and evaluate computer-based instruction with case studies.

5173 Kindergarten-Primary Curriculum (K-2). Current kindergarten-primary (K-2) curriculum models and programs including aims, content, methodology and evaluation. Current trends and issues in early childhood education; curriculum design and implementation. Primarily for administrators, supervisors, teachers and advanced students in early childhood education.

5223* Teaching Science in the Elementary School. Materials, methods and classroom procedures related to science in the elementary school.


5323* Remediation in School Mathematics. Lab 2. Prerequisite: 4150 or equivalent. Identification of specific learning disabilities in school mathematics. Selection of appropriate remedial measures. Completion of a case report.

5270* Practicum in School Mathematics. 1-3 credits, maximum 6. Lab 2-6. Prerequisite: 5263. Diagnostic and therapeutic procedures in mathematics with students of all ages. Laboratory classes provide for clinical experiences in evaluation and instruction with children experiencing difficulty in mathematics.

5380 Workshop in Science Education. 1-4 credits, maximum 4. Develops and/or implements elementary and secondary science programs.

5323* Teaching Social Studies in the Schools. Curriculum, materials, methods and procedures related to social studies.

5350* The Visual Arts in the Curriculum. 1-3 credits, maximum 6. Lab 2. Prerequisite: 4213. Creative approaches to the use of two- and three-dimensional media as they relate to various aspects of education. Opportunities available for periodical study in evaluation in order to give direction and significance to future growth.

5423* Developmental Reading at the Primary Level. Prerequisites: 3283, 4233 and 4290 or 4473. Examination of sequential growth in reading from the preschool level through the early elementary years. Examination of the reading process and instructional procedures.

5433* Developmental Reading at Intermediate and Secondary Levels. Prerequisites: 3283, 4233 and 4290 or 4473. Examination of the developmental reading curriculum at intermediate, middle school and secondary levels including evaluation of teaching methods and materials.

5436* Diagnosis and Treatment of Reading Problems. Prerequisite: 5423. Diagnosis of reading disabilities, remedial measures and work with clinical cases.

5473 Clinical Aspects of Reading Disability. Prerequisite: 5463. Refines the diagnostic and remedial skills of the student through the study of clinical instruments, research, informal measurements and remedial approaches used in reading clinics.

5510* In-Service in Reading. 1-6 credits, maximum 6. Guidance in the development of reading curriculum, programs, methodology and materials for in-service teacher education groups. Content developed around needs of specific groups.

5520* Practicum in Reading. 1-6 credits, maximum 6. Lab 2-4. Prerequisite: 5463. Application of diagnostic and therapeutic procedures with readers of all ages. Laboratory classes provide for clinical experience in evaluation and instruction in developmental and remedial programs in reading for children.

5613* Effective Teaching of Mathematics In The Secondary School. Prerequisite: consent of instructor. Directed advanced practicum in secondary school mathematics education. Includes study of current research findings in mathematical education, teaching strategies, materials and evaluation procedures in the secondary school. For experienced classroom teachers, superintendents, principals and supervisors.

5623* Remedial mathematics in the secondary school. Prerequisites: 4150 or equivalent. Methods and procedures of teaching appropriate remedial mathematics. Selection of appropriate remedial measures. Completion of a case report.

5623* Remedial mathematics in the secondary school. Prerequisites: 4150 or equivalent. Methods and procedures of teaching appropriate remedial mathematics. Selection of appropriate remedial measures. Completion of a case report.

5623* Remedial mathematics in the secondary school. Prerequisites: 4150 or equivalent. Methods and procedures of teaching appropriate remedial mathematics. Selection of appropriate remedial measures. Completion of a case report.

5623* Remedial mathematics in the secondary school. Prerequisites: 4150 or equivalent. Methods and procedures of teaching appropriate remedial mathematics. Selection of appropriate remedial measures. Completion of a case report.
5720 Education Workshop. 1-8 credits, maximum 8. For pre-service, in-service, principal, superintendents and supervisors who have definite problems in instruction or administration. Students must register for the full number of credit hours for which the workshop is scheduled for a particular term.

5732 Seminar in Education. Prerequisite: consent of instructor. Seminar topics may differ depending upon the nature, current interests and topics in American education.

5740 Seminar in Teacher Education. 3-9 credits, maximum 9. For cooperating teachers and university supervisors. Problems and issues in pre-service teacher education. Simulation and laboratory experiences in supervision of student teachers.

5750 Seminar in Mathematics Education. Lab 0-2. Prerequisite: consent of instructor. Problems, issues, and trends in mathematics education.

5753 Audiolvisual Communication Strategies. Lab 2. Prerequisites: 3122 or 4113 and ABSED 5513. For students majoring in audiolvisual education, curriculum development, supervision and administration. Gives students skills to be effective in audiovisual learning environments.

5760 Administration and Supervision of Audiolvisual Materials. Prerequisite: 3122. Building, planning, selecting and purchasing equipment and materials, surveying existing materials, and planning and financing adequate programs. For administrators or teachers who are responsible for audiovisual programs.

5823 History of Education. Prerequisite: 3122. History of elementary, secondary, and higher education in Western Civilization with emphasis upon the development of the American educational institution.

5835 Methods in Physical Education. Prerequisites: PE 4712 and 3773. Prior completion of CIED 5043 recommended. Differentiation between teaching methods in physical education; advantages of the application of the individual methods to particular situations in teaching physical education. Same course as HPELS 5833.

5850 Practicum Study. Lab 1-3. 1-3 credits, maximum 3. Prerequisite: consent of instructor. Directed study for master's level students.

5883 Educational Sociology. The manner in which social institutions and social systems influence education and the educational system in the United States.


6033 Analysis of Teaching. Studies examine research related to the classroom behavior, classroom climate and student behavior and develop competencies in several observational systems.

6080 Seminar in Science Education. 1-6 credits, maximum 6. Problems, issues and trends in science education. The focus at the pre-service or in-service level.

6113 Curriculum of the Elementary School. Contemporary educational philosophies and points of view in elementary school education.

6133 Theory to Practice in Education. Prerequisite: consent of instructor. A culminating seminar demonstrating the application of theory from several disciplines to the practical problems of education: curriculum development, organization, teaching strategies, evaluations, etc.

6152 Current Issues in Art in the School Curriculum. Problems, issues and trends in art education programs of the elementary and secondary schools and their relationship to the total curriculum. For teachers, supervisors and administrators.

6433 Seminar in Reading. Prerequisite: 12 credit hours in teaching of reading. Research in reading including evaluation of research proposals. Problems and issues in reading instruction are discussed using knowledge gained through both research and classroom practice.

6640 Developmental Reading and Exceptionality. Prerequisite: 5423 or 5433. Developmental reading needs of various groups of exceptional individuals. Methods and methods of instruction.

6860 Directed Reading. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Directed reading for students with advanced graduate standing to enhance students' understanding in areas where they wish additional knowledge.

6863 Seminar in Instruction in Reading. Problems and issues related to reading instruction. The roles of various school personnel in effecting change in curriculum and methods.

6880 Internship in Education. 1-8 credits, maximum 8. Lab 3-24. Prerequisite: consent of instructor. Directed off-campus experiences designed to relate ideas and concepts to the practical world encountered in the management of the school program.

6910 Practicum. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Helps the student carry out an acceptable research problem (practicum) in his/her local school situation. Credit given upon completion of the written report.

### ECONOMICS (ECON)

1113 (S) The Economics of Social Issues. Issues-oriented approach. Basic economic principles introduced and developed through study of important social issues; for example, inflation, unemployment, poverty, discrimination; the role of government in promoting public welfare. Develops the economist's approach to social problems, and evaluates the contribution of economics to their solution. No credit for students with prior credit in 2013 or 2023.

2013 (S) Introduction to Macroeconomics. Prerequisite: 15 semester credit hours. The functioning and current problems of the aggregate economy; determination and analysis of national income, employment, inflation and stabilization; monetary and fiscal policy; and aspects of international interdependence.

2083 (S) Introduction to Microeconomics. Prerequisite: 12 credits, maximum 9. Prerequisites: 5423 or 5433. Developmental reading needs of various groups of exceptional individuals. Methods and methods of instruction.

3010 Special Topics In Economics. 1-3 credits, maximum 9. Prerequisites: 2023, prior approval of instructor. Analysis of a contemporary topic in economics. Course content will vary to reflect changing social issues and trends in applied economics.

3023 Monetary Economics. Prerequisite: 2023. Application of economic theory and methodology to decision problems of private industry, nonprofit institutions and government agencies; demand and cost analysis, forecasting, pricing and investment.

3113 Intermediate Microeconomics. Prerequisite: 2023. How the market system organizes economic activity and allocates goods and services. Microeconomic theory developed and applied to the interactions of consumers, producers and resource owners in markets characterized by different degrees of competition.

3123 Intermediate Macroeconomics. Prerequisite: 2023. Development of a theoretical framework for studying the determinants of national income, employment and general price level. National income accounting, consumption, investment, government spending and taxation, the supply of and demand for money. Monetary, fiscal and incomes policies considered with regard to unemployment, inflation and economic growth.

3313 Money and Banking. Prerequisite: 2023. The economics of money and its effects on: interest rates, employment and price levels; introduction to monetary economics and international banking concludes the course.

3423 (S) Public Finance. Prerequisite: 3 credit hours in economics. The economics of the government sector. Scope of government activity, efficiency in government expenditure, federal budget, fiscal and debt management policy, Principles of taxation. Major tax sources, tax distribution, tax issues. Current public finance problems such as revenue sharing, negative income tax, urban transportation systems and national health insurance.

3513 Labor Economics and Labor Problems. Prerequisite: 3 credit hours in economics. Economics analysis of contemporary labor market problems and survey of U.S. unionism. The labor force, education and training, discrimination, inflation and unemployment theories of the labor movement, economic impact of unions and public policy toward labor.

3523 (S) Poverty and Economic Insecurity. Prerequisite: 3 credit hours in economics. Problems, programs and proposals for dealing with poverty and economic insecurity.

3613 (S) International Economic Relations. Prerequisite: 3 credit hours in economics. International trade and finance; international economic organizations; the foreign economic policy of the U.S.

3713 Government and Business. Prerequisite: 3 credit hours in economics. Methods of measuring the extent of monopoly power in American industries and ways of evaluating the effects of this power on consumer welfare; U.S. antitrust laws, their enforcement and landmark court decisions under these laws.

3813 Development of Economic Thought. Prerequisite: 3 credit hours in economics. The ideas of great economists with emphasis upon economic concepts and systems of thought in relation to social, ethical and political ideas under evolving historical conditions.

3823 (S) American Economic History. Economic development and economic forces in American history; emphasis upon industrialization and its impact upon our economic society since the Civil War. Same course as HIST 4513.

3903 Economics of Energy and the Environment. Prerequisite: 5423 or 4013. Basic quantitative methods used in economic analysis emphasizing applications to economic problems and interpretation of empirical results. Statistical analyses, regression and forecasting techniques using computer programs.

4223 Business and Economic Forecasting. Prerequisites: 2023; STAT 3013 or 4013. Basic quantitative methods used in economic analysis emphasizing applications to economic problems and interpretation of empirical results. Statistical analyses, regression and forecasting techniques using computer programs.

4313 Advanced Banking. Prerequisite: 3313. Central and commercial banking, including Federal Reserve policies, banking structure, capital adequacy and taxation of banks. Friedman's proposals for monetary and banking reform.
5133 Microeconomic Theory I. Prerequisites: 3123, MATH 2263 or MATH 2713. National income, employment and the price level from the point of view of comparative statics.

5143 Macroeconomic Theory II. Prerequisite: 5133. National income, employment and the price level from the point of view of dynamics. Growth models.

5163* Microeconomic Theory II. Prerequisite: 5123. Contemporaneous price and allocation theory with emphasis on general equilibrium analysis. Welfare economics.

5223 Mathematical Economics I. Prerequisites: 3113, MATH 2263 or equivalent. Mathematical concept of single variable and multivariate calculus, topological properties of Euclidean space, convergence, linear algebra, optimization theory and the Kuhn-Tucker Theorem with applications from economic theory.

5233* Mathematical Economics II. Prerequisite: 5223. A mathematical approach to general equilibrium and welfare economics.

5243 Econometrics I. Prerequisite: 4213 or STAT 4043. Theory and application of econometrics to economic problems. Topics include OLS, GLS, distributed lags, serial correlation, heteroskedasticity, and simultaneous equations.

5253 Econometrics II. Prerequisite: 5243. Advanced econometric theory covering single and simultaneous equations models, seemingly unrelated regressions, limited dependent variable models, causality, and pooled models.

5313* Monetary Economics I. Contemporary issues in monetary theory and policy. Demand for money and supply of money theory, interest rate theory and issues in monetary policy.

5323 Monetary Economics II. Intensive analysis of classical monetary theory and individual research on selected problems in monetary economics. The ideas of Patinkin, Wickless, Fisher and Keynes.

5413 Economics of the Public Sector I. Allocation and distribution effects as well as incidence of governmental budget policies.

5433 Economics of the Public Sector II. Fiscal policy as a means of promoting economic stabilization and growth.

5533 Managerial Economics. Prerequisite: 5523. Microeconomic theory of the firm and its application to business decision making. Concepts of microeconomics and macroeconomics related to understanding the economic system, analysis of policy, forecasting, and international economics. No credit for M.S. and Ph.D. students in economics.

5523 Microeconomic Theory I. Prerequisites: 3113, MATH 2263 or MATH 2713. Contemporary price and allocation theory with emphasis on comparative statics.

5643 Economic Development II. Major problems of development policy. Inflation and mobilization of capital, investment criteria, agriculture, foreign trade, population and manpower, planning and programming methods.

5713* Industrial Organization I. Organization and operation of the enterprise sector of a free enterprise economy; interrelations of market structure, conduct and performance; public policies affecting these elements.

5723* Industrial Organization II. Alternate market structures and their relationships to market performance; the empirical evidence concerning these. Public policies toward business, including antitrust laws and economic analysis of their enforcement; theories of public utility regulation.

5813 History of Economic Thought. Economic theories from the 18th century until the present with emphasis on the origin and improvement of analytical tools.

5903 Regional Economic Analysis and Policy. Selected topics in location theory, regional economic growth and policies toward regional development in the U.S.

5913* Urban Economics. The urban area as an economic system. Problems of economic policy in urban environment.

6010 Research and Thesis. 1-12 credits. maximum 30. Prerequisite: approval of advisory committee. Workshop for the exploration and development of research topics. Research leading to the Ph.D. dissertation.

6010 Seminar in Economic Policy. 1-3 credits, maximum 6. Intensive analysis of selected problems in economic policy. Individual research, seminar reports and group discussion of reports.

6113 Seminar in Economic Theory. Microeconomics.


6813 Seminar in Economics Systems. Selected topics dealing with the economic theory and institutions of capitalism, socialism, communism, and fascism. Individual research, seminar reports, and group discussion of reports.

EDUCATION (EDUC)

1111 Orientation to Education. Required of all first-semester freshmen in the College of Education. An orientation course; study of the profession of education with particular emphasis on the skills and qualities required. Graded on pass-fail basis.

3110 Honors Directed Study. 1-3 credits, maximum 3. Prerequisite: admission to College of Education Honors program. Individualized directed study approved by a sponsoring professor or Honors coordinator.

4050 Honors Colloquium. 1-9 credits, maximum 9. Prerequisites: senior standing and consent of instructor or Honors Program. Study of an interdisciplinary and interdisciplinary nature of various important issues and aspects as related to the field of education. Provides an intellectual challenge for the able student with a strong dedication to scholarship.

4110 Teacher Education Seminar. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Problems, trends, and pertinent education issues. May include simulation, small group instruction and field-based experiences. For the practicum or in-service level.

4920 Teacher Education Practicum. 1-9 credits, maximum 9. Prerequisites: admission to Teacher Education and 15 credit hours of professional education. Directed observation and supervised laboratory and clinical experiences in appropriate teacher education program areas. Appraisal and learning theory approaches employed.
5113* Women in Education. Methods, practices, and materials prevalent in educational institutions at all levels in the United States and their ultimate effect on females and males both as individuals and as members of socio-cultural and educational systems. 2-6 credits, maximum 6. Prerequisites: senior or graduate standing and consent of instructor. Guided field experience appropriate to a specific program of study. Field experience preceded and followed by appropriate on-campus seminars, readings and reports.

5910 Professional Field Experiences. 1-6 credits, maximum 6. Prerequisites: senior or graduate standing and consent of instructor. Directed field experience appropriate to a specific program of study. Field experience preceded and followed by appropriate on-campus seminars, readings and reports.

6020 Seminars in Education. 2-6 credits, maximum 6. Prerequisites: consent of instructor. Limited to graduate students who have experience in the field and knowledge of elementary techniques in research. Students pursue individual research problems under the direct supervision of members of the staff.

6023 Doctoral Seminar. Prerequisite: approval of adviser. Open to all doctoral aspirants dealing with preparation of members of the staff. Application of modern and historical theories of research and training for teaching and/or administrative experience. Special problems of proposal and dissertation preparation and design of the proposed research.

EDUCATIONAL ADMINISTRATION AND HIGHER EDUCATION (EAHED)

4223 Community Education: A Synopsis. Lab 1. Prerequisite: 3 hours of one of the following: CIED 2113, HEECS 4353, 4413, 4853, LEIS 2413, or SOC 1113. Introduction to community education through classroom and field-based activities and the history, philosophy, organization, roles, and publications of community education. Perspective of how community education has evolved in relation with adult education, community colleges, public schools, and recreation.

4622 Teachers and the Law. An analysis of school-related areas out of which litigation arises, focusing especially on the legal rights and responsibilities of teachers, administrators and pupils and the generally applicable principles of law.

5000 Thesis or Report. 1-10 credits, maximum 10. Prerequisite: consent of instructor. Master's students may earn up to two hours of credit for a report or six hours of credit for a thesis. Students working on a specialist's report may earn a maximum of 10 hours of credit.

5633* Community Education. Purpose, organization and administration of community education and its various components.

5813 Public School Administration. The scope and function of public school administration.

5833* Public School Finance. Prerequisite: graduate standing. Development of conceptual bases in economics of education, taxation, distribution systems, policy analysis; application to Oklahoma school finance; and introduction to budget development.

5853 Educational Systems, Design and Analysis. Prerequisite: 5 credits hours of statistics. Current research literature in educational administration, both common school and post-secondary studies. Substantial application of statistical and research skills to educational administration.

5951 Organization and Administration of Occupational Education. 1-3 credits, maximum 6. The organization and implementation of vocational-technical education with special attention on federal-state-local organizations and the implications of current legislation for implementing new programs.


6003 Educational Ideas. Seminar for majors in EAHED. Decision-making processes utilized in educational systems today.

6230* Critical Issues in Higher Education. 1-3 credits, maximum 3. Prerequisite: 6753. Issues that have shaped and are shaping higher education in American society.

6243* Organization and Administration in Education. Research and best practice in the organization and administration of educational organizations.

6253 The Principalship. Prerequisites: 5813, 6243 and 6263. Strategies, techniques and solutions the principal can utilize in the operation of a public school. Developing policy statements, handbooks, budgets, schedules, etc.

6263 Supervision. The place of supervision in the improvement of instruction; a study of fundamental principles and procedures.

6333 Public School Business Management. Prerequisite: 5833. Knowledge and skills in budget planning and development, laws, and court cases concerning higher education. School accounting other business management topics.


6393 School Personnel Administration. Relationships between administration and other school personnel; recruitment, selection, promotion, morale, salary, staff relations and evaluation of teaching.

6420* The Politics of Education. 2-3 credits, maximum 3. Activities of schools as they relate to the political environment; e.g., voter behavior, change strategies and community power structures.


6463 Higher Education Law. National and state constitutional provisions and court cases concerning higher education. Considerable legal research required.

6473* Practicum in Instructional Supervision. Prerequisite: 6243. Application of supervision approaches to instructional supervision through practice in recording and analyzing teacher behavior in actual classroom settings. Clinical and group methods for improving instruction are considered.

6572* School Housing. Prerequisites: 6363 and 6453, or equivalent. Established standards and research in school housing; validity of old and new standards.

6603* Organizational Theory in Education. Prerequisite: 6243. Selected organizational typologies, conceptualizations and theoretical frameworks as they relate to educational behavior and personnel in organizations.

6613* Organizing, Developing and Administering Community Higher Education. Relationship between education and the community, with special emphasis on community needs/resources and the development of a total community education program. Skills and competencies for planning, implementing and evaluating community education programs are explored.

6622 The School-Community Survey. Application of survey techniques and methodologies to educational facilities, curricular programs, resource requirements, and school-community-business relations.

6651 Problems in Educational Administration. 1-4 credits, maximum 8. Prerequisite: consent of instructor. Special administrative problem in common schools or higher education, e.g., school plant, school/community relations, administration and the instructional programs, attrition and finance.

6683 The Community Junior College. The American two-year college including historical and philosophical development, curricula, students and the learning process, faculty and instruction, administration and governance, support and control. Principles, practices and problems of community junior colleges in America.

6703 Finance in Higher Education. Prerequisite: 6753. Problems and prospects of financing American education with in-depth discussion of selected topics, e.g., social capital, federal aid, faculty salaries and state support.

6710 Special Problems. 1-4 credits, maximum 8. Prerequisite teaching or administrative experience. Assists administrators with either recurrent or unique problems arising in common schools or in higher education. Emphasizes evaluation and planning related especially to staff, programs and faculty needs.

6713* Effective Teaching in Colleges and Universities. Research findings on teaching-learning relationships at the college and university level. Study of methods employed to encourage and guide and evaluate student learning. Investigation and appraisal of new instructional methods and trends.

6720 Education Workshop. 1-4 credits, maximum 8. Enables public school and higher education personnel to analyze institutional and/or administrative problems.

6730 Planning and Educational Change. 1-4 credits, maximum 4. Includes organizational and environmental perspectives on school/community change, barriers to change, and strategies for planning and implementing organizational change.

6753 Historical Development of Higher Education. History and development of higher education, studies of objectives and functions of institutional types and of students and faculty.

6803 Administration in Higher Education. Prerequisite: 6753. Functions and principles of administration in higher education from historical and contemporary points of view. Both internal and external forces acting on the institution.

6813 Academic Programs: Development and Implementation. Principles, curricula, organization and administrative leadership in higher education emphasizing an analysis of the academic department and its leader, the department head.

6833 College and University Presidency. Prerequisite: 6803. For those who anticipate a career in college and university administration or a related management position. The role and function of the presidency.

6843* The Academic Department. Organization and administration of academic programs emphasizing analysis of the academic department and its leader, the department head.

6850 Directed Reading. 1-4 credits, maximum 6. Prerequisite: consent of instructor. Directed reading for students with graduate standing.

6870* Seminar. 1-4 credits, maximum 10. Prerequisite consent of instructor. Topics issues related to administration and/or higher education, including research techniques available to analyze such topics.

6880 Internship in Education. 1-4 credits, maximum 8. Prerequisite: consent of department head. Directed internship experiences designed to relate ideas and concepts to problems encountered in education by faculty and administrators.
ELECTRICAL and COMPUTER ENGINEERING (ECEN)

2211 Digital Computing for Engineers. FORTRAN compiler language, philosophy of automatic computer programming. Provides selected numerical methods oriented toward the solution of engineering problems on the digital computer.

3013 (L)Experimental Methods. Lab 4. Prerequisites: 3613 and ENGS 2613, concurrent enrollment in 3113 and 3313. Basic electrical and electronic measurements and instrumentation techniques and devices. Operating principles and application of various instruments used in the practice of electrical engineering. Experiments in electronics and electromagnetic fields, designed to reinforce principles introduced in ECEN 3313 and ECEN 3613. Data processing and reduction techniques.


3213* Microcomputer Principles and Applications. Lab 2. Prerequisite: junior standing or above. Introductory microcomputers. Digital logic elements and number systems; memory components and organization. Microprocessor and microcomputer system architecture, assembly language programming, software development, interfacing techniques. Same course as COMSC 3213.


3313 Electronic Fundamentals and Applications. Prerequisites: 3713, ENGS 2613, MATH 2613, concurrent enrollment in 3013, 3113. Solid-state, discrete-component electronics; diode and transistors, clipping and limiting circuits, power-supply filters and linear low-frequency amplifiers.

3413 Controls I. Prerequisites: ENGS 2122 or ENGS 2613, MATH 2613; concurrent enrollment in 3613 and 3713. Laplace and z-transforms, solutions to differential and difference equations. Transfer functions and block diagrams, manipulation. Modeling of mechanical and electronic systems. Introduction to feedback and control system design using the root locus diagram.


3613 Fundamentals of Electromagnetic Fields. Lab 2. Prerequisites: ENGS 2613, MATH 2613; concurrent enrollment in 3413 and 3613. Laplace transform, transfer functions, magnetically coupled circuits and two-port networks.

4001 Electrical Engineering Seminar. Prerequisite: senior standing. Topics on professionalism technical and professional societies, and current industrial developments. Individual or group reports prepared and presented.

4010 Technical Problems and Engineering Design. 1-12 credits, maximum 12. Prerequisite: consent of instructor. Individually independent study projects selected in consultation with an instructor, analysis of design, specification, simulation, and testing; laboratory and computer experiments; literature searches and computer simulations may be involved.

4013 Senior Design Laboratory I. Lab 4. Prerequisites: 3013, 3313, 3413, and 3213 or 3233. The design cycle for several small projects, each including establishing objectives, formulating a method, constructing a system to test predictions, and writing a formal report. Use of modern lab equipment and fabrication techniques. Development of communication skills.

4023 Senior Design Laboratory II. Lab 4. Prerequisite: 4013. Continuation of ECEN 4013. Student project teams design, build, test and present results for realistic projects from university and industrial sponsors. Formulation of specifications, consideration of alternative solutions, feasibility considerations, detailed system descriptions, economic factors, safety, reliability, aesthetics, ethics and social impact.

4025 Project Engineering Laboratory. Lab 4. Prerequisites: 3022, 3223, 3313. Practical advanced lab experience. Several small projects designed, built, packaged and tested in teams on realistic projects from industrial sponsors.

4133* Power Electronics. Prerequisite: 3113. Power electronic devices, components, and their characteristics, DC to AC conversion, fundamental of inverters and waveshaping devices; application aspects; control aspects; characteristics and state-of-the-art of advanced power inverter and power conditioning topologies.

4153* Power System Analysis and Design. Prerequisite: 3113. Power system component models from circuit theory. Formulation and design of the load flow model and the optimum economic generator allocation problem utilizing computer methods.


4243 Computer Architecture. Prerequisites: 3213 and 3223. Structural organization and hardware design of digital computer systems. Review of logic circuits, integrated circuits and data representation. Register transfer language, CPU organization, microprogram control, arithmetic processor design, input/output and memory organization. Survey of advanced architectures.

4263 Computer Engineering Projects. Lab 2. Prerequisites: 3213, 3223 and 4213. Team projects involving design, construction, and testing of hardware interfaced with microprocessors and microcontrollers. Laboratory Emphasis on software and hardware documention. IEEE-488 bus; interface chips; comparison of minicomputers, microprocessors, and controllers; bus transfer, 6800 bus; bus analyzer; LSI interface chips; mini- and micro-computers as laboratory tools and system components.


4303* Digital Electronics Circuit Design. Lab 2. Prerequisite: 3313. Theory of digital and electronics circuits. Digital logic families TTL, IIL, ECL, NMOS, CMOS, GaAs. Linear signal models for transistors. Implementation at RAM and ROM. Circuit design for LSI and VLSI.


4353 Communication Electronics. Prerequisite: 3313. Design of tuned voltage and power amplifiers, oscillators, modulators, modulation and detection, and parametric amplifiers.

4413 Controls II. Prerequisites: 3413, 3513, 3713. Design of analog control systems, time-delay design of discrete-time systems, sampling, relationship between pole locations and time response, frequency domain design, root locus design, continuous-time and discrete-time compensation techniques, state variable feedback and pole positioning design.


4533 Data Communications. Prerequisite: 4503 or STAT 4533. Signal detection in noise. Tradeoffs between bandwidth and signal-to-noise ratio and rate of information transfer. Line coding, error detection and correction. Elements of computer network design. Data link protocols.

4613 Microwave Engineering and Antennas and Propagation. Prerequisite: 3613. Engineering and design of microwave systems, radiation and propagation of microwave energy. Design theory of waveguides, waveguiding systems, antennas and aspects of atmospheric propagation. Passive microwave devices such as attenuators, directional couplers and resonators. Microwave antennas; electromagnetic horns, parabolic reflectors and log-periodic structures. Atmospheric propagation; propagation in a horizontally stratified atmosphere.

4623* Plasma Dynamics and Microwave Electronic Devices. Prerequisite: 3613. Plasma phenomena and their application to practical devices. Devices that relate to microwave power generation. Phase space, distribution functions in plasma systems. Behavior of motion of charged particles in electromagnetic waves, hydromagnetic waves in plasmas, pinch effect, etc. Electron beams, klystrons, plasma, traveling-wave and klystron amplifiers. and oscillators.

4703 (L)Active Filter Design. Lab 2. Prerequisites: 3413 and 3713. Introduction to passive filters; operational amplifiers as filter elements; design of active filters. Laboratory design projects and computer simulation.

4713* Introduction to Network Synthesis. Prerequisite: 4723. The design and analysis of transfer functions and point synthesis, passive and active network synthesis.

Prerequisites: 3313, 3613. Exten-

Optical Electronics.

Solid-State Electronics I. An advanced study of elec-
tronic networks. Application of solid-state devices to the
modeling and low-frequency behavior of circuits. Inter-
site, active components as replacements for discrete-component
networks. Dis-
crete and integrated operational amplifiers. Broad-band
and tuned amplifiers.

Advanced Power Electronics. Prerequisite: 4133. Char-
acteristics of high power semiconductor devices and the
application of such devices to power conditioning, in-
version, and wave shaping at high power levels.

CMOS Analog Integrated Circuit Design. Prerequisite:
4313. Advanced study of solid state CMOS linear
integrated circuits. Topics include: Op Amps, compara-
tors, multipliers, D/A and A/D converters and Op Amp
building blocks. Op Amp building blocks include,
differential pairs, current mirrors, gain, output stages,
and references. VLSI layout and circuit simulation using
SPICE.

Control Systems I. Prerequisite: 5173. Optimal control
theory for modern systems design. Specification of opti-

mum performance indices. Dynamic programming, cal-
culus of variations and Pontryagin’s minimum principle.

Introduction to Stochastic Systems. Prerequisites:
5313 and 4503 or STAT 4033. Theory and applications
involving probability, random variables, functions of ran-
dom variables, and stochastic processes, including
Gaussian and Markov processes. Correlation, power
spectral density, and nonstationary random processes.

Introduction to Stochastic Systems. Prerequisites:
5313 and 4503 or STAT 4033. Noise as a random process,
analog and digital signal detection in the presence of

noise, optimum receiver design using signal space con-

straints. Introduction to information theory and the

relationship between bandwidth, signal-to-noise ratio and the rate of

information transfer. Example system designs include

eardata transmission and data compression. Feedback

systems and communication systems and computer communication nets.

Data Transportation and Protection. Data and its
representation: factors such as error detection and

randomization of images, coding, enhancement, restoration and

separation. Use of transforms. Use of ECEN VAX/COMTAL image processing

systems to develop skills in using and writing image-processing software.

Optical Engineering. Physical and physiological con-

cepts of vision. Review of refraction, reflection, diffrac-

tion. Analysis of basic optical devices: dielectric

interfaces, mirrors, optical cavities. Laser as an electronic

cell: ½ to 1½ discrete com-

ponents as needed. Specialized software to integrate

the computer and its peripherals. Experimental opportu-

nities provided.

Digital Systems Testing. Prerequisite: 3223. Testing of

combining and sequential circuits. Test generation tech-
niques. Corrected code testable circuits and systems.

Testing for LSI and VLSI.

Analyzing and design of digital computers. Arithmetic

algorithms and the design of the arithmetic/logic unit (ALU). Serial

and parallel data processing; control and timing systems;

microprogramming; memory organization alternatives;

input/output interfaces. Same course as COMS 5253.

Digital Computer Design. Prerequisite: 3223. Analy-
sis and design of digital computers. Arithmetic

algorithms and the design of the arithmetic/logic unit (ALU). Serial

and parallel data processing; control and timing systems;

microprogramming; memory organization alternatives;

input/output interfaces. Same course as COMS 5253.

VLSI Digital Systems Design. Prerequisite: 4303;

recommended: 5253. Design of very large-scale digital

systems emphasizing the use of MOS technology. Design

rules imposed by fabrication techniques. Sys-

tematic structures for control and data flow; system tim-

ing; highly concurrent systems. Experimental

opportunities available.

Artificial Intelligence and Expert Systems. Fun-
damental concepts: search-oriented problem solving,
knowledge representation, logical inference, building an

expert system, languages and software tools and

machine architectures. Applications to planning, com-

plexity of the model and to obtain the steady-state
response.

Engineering Systems Reliability Evaluation. Tech-
niques and concepts needed for evaluating the long-

and short-term reliability of a system. Topics include static

and spinning generation capacity; transmission, com-

posite, interconnected, and terrestrial communication

networks. Applications to systems other than power systems included. For students with little or

no background in probability or statistics.

Direct Energy Conversion I. Energy conversion tech-
niques and applications; thermoelectricity, thermionics,

power electronics, and power systems involving electrical,

mechanical and thermal energies. State-of-the-art

developments in direct energy conversion using selected

papers from journals and other publications. Gives the student a perspective on the role of these systems

associated with satisfying future energy

requirements.

Microcomputer System Design. Prerequisites: 3213 and
3223. Design, construction, programming, debug-

ging and documentation of microcomputers interfaced to

peripheral devices. Electronics considerations for

incorporating different families of I/O and discrete com-

ponents as needed. Specialized software to integrate

the computer and its peripherals. Experimental opportu-

nities provided.

Digital Systems Testing. Prerequisite: 3223. Testing of

combining and sequential circuits. Test generation tech-
niques. Corrected code testable circuits and systems.

Testing for LSI and VLSI.

Digital Computer Design. Prerequisite: 3223. Analy-
sis and design of digital computers. Arithmetic

algorithms and the design of the arithmetic/logic unit (ALU). Serial

and parallel data processing; control and timing systems;

microprogramming; memory organization alternatives;

input/output interfaces. Same course as COMS 5253.

VLSI Digital Systems Design. Prerequisite: 4303;

recommended: 5253. Design of very large-scale digital

systems emphasizing the use of MOS technology. Design

rules imposed by fabrication techniques. Sys-

tematic structures for control and data flow; system tim-

ing; highly concurrent systems. Experimental

opportunities available.
ELECTRICAL POWER TECHNOLOGY (EPT)

3103
Introduction to Electrical Power. Lab 3. Prerequisites: junior standing and trigonometry. Overview of the electrical industry with selected topics and laboratory to familiarize the student with electrical power systems. Technical language and symbology of the industry; surveying as applied to the needs of electrical power.

3213
Power Systems. Prerequisites: MATH 2373 and basic electricity. Voltage, current and power relationships in single-phase and polyphase electric circuits and systems. Power transformers theory, operation, testing, and connections to power systems. Methods of starting and controlling electrical machines.

3224
Power Circuits and Machinery. Lab 3. Prerequisite: 3213. Balanced operation of poly-phase electric circuits; DC and AC machinery and power transformers. Laboratory includes connections, testing and terminal behavior of operational electronic machinery and transformers. Control of both DC and AC machinery.

4003

4050
Advanced Electrical Power Problems. 1-4 credits, maximum 4. Prerequisite: junior standing and consent of head. Special problems in the electrical power area.

4113
Power Systems II. Prerequisites: 3213, 3224, MATH 2383. Transmission and distribution line parameters, system modeling techniques, load flow analysis, mathematical techniques in the analysis of large networks. Problem procedures are computer assisted.

4124
Switchgear and Protective Relaying. Lab 3. Prerequisite: 3213. Types of switchgear and protective devices designed as to construction, use, testing, installation and maintenance.

4134

4653
Applications of Electromagnetic Theory II. Applications of quantum electrodynamics. Topics of current interest with sufficient mathematical sophistication to equip the student for state-of-the-art research in the area.

6713

6723*
Nonlinear Systems Analysis II. Prerequisite: 5723 or MAE 5723. Topics in nonlinear system theory selected from the current literature. May include nonlinear stability, time delay, multi-input describing functions, nonlinear feedback control theory, the problem of Lure and Popov's criterion, multivariable perturbation theory.

6813
Solid-State Techniques. Prerequisite: 5813. Device fabrication: wafer preparation, etching and masking techniques, alloying, bonding, testing, epitaxial techniques, special topics.

ELECTRONICS AND COMPUTER TECHNOLOGY (ECT)

1003

1104

1112

1224

1244

2213
Essentials of Electricity. Lab 2. Prerequisites: MATH 1513, 1613. Electric circuits and machines, including Ohm's law, magnetism, direct-current motors, generators and controls, alternating current, single-phase circuits, polyphase circuits and alternating current machinery. For non-electronics majors only.

2303
Measurements and Control. Lab 2. Prerequisites: 1224 and 1244. Corequisite: 2544, MATH 2373. Electrical and electronic measurement techniques. Programming and use of programmable logic controllers. Emphasizes on acquiring a measurement and developing the control signal logic.

2544
Pulse and Digital Techniques. Lab 3. Prerequisites: 1224, 1244, and MATH 1613. Electronic circuits used in digital control and computation. Pulse generation, Boolean algebra and logic circuits.

2633
Microcomputer Principles and Applications. Lab 3. Prerequisites: 2544 and COMSC 2113. Introduces microprocessors from a hardware point of view, combining a study of machine language programming and microcomputer hardware in a highly laboratory-oriented presentation. Emphasizes interfacing the microcomputer as a programmable controller of external systems and devices.

2634
Communication Circuits and Systems. Lab 3. Prerequisites: 1224, 1244, 2303, MATH 2373. Receiver and transmitter circuits and systems, introduction to elementary antennas, modulation and detection systems, oscillators and tuned amplifiers.

3731
Electronic Fabrication Techniques. Lab 3. Prerequisites: 2303 and 2634. Laboratory projects for modern electronics engineering technicians. Circuit test, development and fabrication in wired and printed form.

3803

3803

4024
Circuit Analysis II. Prerequisites: 2544, COMSC 2113 and MATH 2373. Application of elementary switching functions and Laplace transforms to electronic circuit analysis. Programming and applications in the S-plane, transfer functions and computer applications.

4113
Numerical Methods for Technology. Lab 3. Prerequisites: 2544, MATH 1715. Advanced topics in numerical methods and programming techniques for the solution of engineering technology problems. Microcomputer and associated software used to solve matrices and simultaneous linear equations, interpolation and approximation, solve differential equations, Fourier analysis, and fast Fourier transforms.

4324
Nondestructive Testing. Lab 2. Commonly used nondestructive testing in industry; radiography. Magneflux, liquid penetrant, ultrasonic and eddy current testing.

4623
Electronic Digital Systems. Lab 3. Prerequisite: 2633. Use of both microcomputers and microprocessors in controlling I/O devices. Students required to develop interface circuitry in a project setting to meet assigned specifications. Programming of a PDP-11 in assembly language.

3354
Electronic Amplifiers II. Lab 3. Prerequisite: 1224. Advanced topics in amplifiers, bias, signal amplification and feedback, stability of feedback amplifiers, DC amplifiers, differential amplifiers and operational amplifiers.

3363
Data Acquisition and Control. Lab 3. Prerequisites: 2633 and 2653. Data communications including multi-channel digital communications and controlling I/O equipment. Silicon-controlled rectifiers as power-control devices.

4500
Advanced Electrical Problems. 1-4 credits, maximum 4. Prerequisites: junior standing and consent of head. Department. Special problems in the electrical area.

4513
Data Communications. Lab 3. Prerequisites: 2633 and 2653. Data communications including multiplexing concepts, sampling techniques, encoding techniques. Telemetry, digitized voice, TTY, and bulk transmission systems.

4314
Control Circuits. Lab 3. Prerequisite: 3113 Components, principles and techniques basic to electronic control systems. Feedback control theory, transducers, sensors and motors.

4654
Microwave Techniques. Lab 3. Prerequisites: 2634, 3113. Communication principles and measurement techniques in the UHF and microwave spectrum, coaxial and waveguide transmission lines, antenna systems and signal transmission, modulation and detection, oscillators and amplifiers, introduction to signal transmission and modulation methods.
ENGINEERING (ENGR)

1111 Introduction to Engineering. Advisement, counseling and enrollment procedures; methodology in solving engineering problems; engineering ethics and practice.

1212 Introduction to Engineering II. Prerequisite: 1111. Continuation of 1111.

1311 Introductory Engineering Graphics. Principles, techniques and skills of graphics as used in engineering.


1501 Women in Engineering Seminar. Prerequisite: consent of instructor. Opportunities to meet and talk with established women engineers. Potential problems faced by women in engineering and topics of particular interest to women students in engineering.

2020 Co-op Industrial Practice I. 1-6 credits. maximum 12. Prerequisites: sophomore standing and permission of Co-op coordinator. Pre-engineering industrial practice. Written reports as specified by adviser. Application of credit to meet degree requirements varies with level and department.

2100 Orientation Projects. Lab 2-6. 1-3 credits. maximum 3. Prerequisite: pre-engineering standing. Enrollment in independent study or small groups. Projects to assist students with special needs to adjust to engineering curriculum.

2113 (N)Science and Technology in a Modern Society. Prerequisite: MATH 1314 or MATH 1513 or equivalent. Concepts and ideas in science and technology relevant to participation in decisions in our technological age.

3030 Co-op Industrial Practice II. 1-6 credits. maximum 12. Prerequisites: junior standing and permission of Co-op coordinator. Pre-engineering industrial practice. Written reports as specified by adviser. Application of credit to meet degree requirements varies with level and department.

3111 Introduction to Engineering for Transfer Students. Prerequisite: transfer status with 28 or more credit hours. Adjustments from previous college situation needed to select a proper course of courses based on abilities, aptitudes and interests.

3333 (N)Acoustics of Music and Speech. Prerequisite: 45 credit hours completed. Algebra base treatment of the physical principles of sound in music and speech, and the sense of hearing. Sound production by musical instruments, acoustic response of auditoriums, and principles of sound reinforcement.

4030 Co-op Industrial Practice III. 1-6 credits. maximum 12. Prerequisites: senior standing and permission of Co-op coordinator. Pre-engineering industrial practice. Written reports as specified by adviser. Application of credit to meet degree requirements varies with level and department.

4060 Topics in Technology and Society. 1-3 credits, maximum 6. Prerequisites: senior standing and permission of Co-op coordinator. Pre-engineering industrial practice. Written reports as specified by adviser. Application of credit to meet degree requirements varies with level and department.

5010 Studies in Engineering Instruction and Research. 1-3 credits, maximum 6. Prerequisite. Current or expected appointment as a graduate teaching or research assistant. Formalizes the participation of the teaching and research assistant in the procedures and seminars necessary for satisfactory performance of duties. Not to be used on study plans toward a degree in the Graduate College. Graded on pass-fail basis.

ENGLISH (ENGL)

0003 Remedial Composition for International Graduate Students. Lab 2 Sentence structure, paragraphing, diagrammatic usage, punctuation, vocabulary, pronunciation and documentation. Graded on pass-fail basis.

1013 Basic Composition. Intensive instruction in grammar and error avoidance (especially the differences between spoken and written language), paragraph structure, and essay writing. May be used for skills remediation or to satisfy high school curriculum deficiency in English.

1010 Studies in English Composition. 1-2 credits. maximum 2 Special study in composition to allow transfer students to fulfill general education requirements as established by Regent's policy.

1013 International Freshman Composition I. Lab 2. Restricted to students whose native language is not English. Expository writing with emphasis on structure and development. Special attention to problems of English as a second language. This course may be substituted for 1113.

1033 International Freshman Composition II. Prerequisite: 1013. Restricted to students whose native language is not English. Expository composition with emphasis on technique and style in writing research papers. May be substituted for 1213.

1113 Freshman Composition I. The fundamentals of expository writing with emphasis on structure, development and style.

1213 Freshman Composition II. Prerequisite: 1013 or 1113. Expository composition with emphasis on technique and style through intensive and extensive readings.

1313 Critical Analysis and Writing I. Prerequisite: English ACT score 24 and above. Review of fundamentals as necessary. Individualized instruction in writing on topics based on discussion of student's interests. Class size limited. This course may be substituted for 1113.

1413 Critical Analysis and Writing II. Prerequisites: advanced-standing credit or an "A" or "B" in 1113 and acceptable ACT scores. Individually directed writing growing from discussions of books and ideas. Class size limited. This course may be substituted for 1213.

1923 Masterpieces of Literature. Readings in the great works of the most important writers of Britain and America, such as Shakespeare, Dickens, Twain, Faulkner, and others.

2023 (H)Readings in Biological Sciences. Reading and study skills, systematic thinking processes and abilities in organization and expression as applied to the life sciences.

2333 Introduction to Technical Writing. Prerequisite: 1113. Does not meet any part of the six-hour composition requirement for the bachelor's degree. Technical literature and publications in the student's area of specialization. Emphasis on clarity, simplicity and careful organization.

2413 (H)Introduction to Literature. Fiction, drama/ film and poetry. Written critical exercises and discussion.

2445 (H,SpD)Languages of the World. A comprehensive survey of world languages. The essential structural and historical organization of languages. The process of languages as a basic human function. Same course as FLL 2445.

2513 (H)Introduction to Creative Writing. Literary composition with emphasis on techniques and style through readings and writings in fiction, poetry and drama.

2543 (H)Survey of British Literature I. The beginnings through the Neo-Classic Period.

2653 (H)Survey of British Literature II. The Romantic Period to the present.

2773 (H)Survey of American Literature I. The Puritans through the Romantic Period.

2883 (H)Survey of American Literature II. The Romantic Period to the present.

3003 English Major Internship. Prerequisite: 9 hours of English. A practicum to allow the student to experience various vocational situations and demands.

3033 Fiction Writing. Prerequisite: 2513. Directed readings and practice in writing fiction with special attention to techniques.

3043 Poetry Writing. Prerequisite: 2513. Directed readings and practice in writing poetry with special attention to techniques.

3053 Scriptwriting. Prerequisite: 2513. Directed readings and practice in writing scripts with special attention to techniques.

3123 (H)Classical Mythology. The heritage of classical Greek and Roman myths as revealed in selected examples of British and American literature.

3143 (H,SpD)American Folklore. Historical perspective, traditional, common cultural experiences and varied ethnic contributions to American life before the Century as expressed in American folklore.

3163 World Literature I. Selected literary masterpieces exemplifying ideals and values in Western cultures.
6. Practice in writing appropriate documents such as Internship in Technical Writing. Seminar in British Literature of the 20th Century.

Seminar in British Literature of the 19th Century.

Seminar in British Literature of the 18th Century.

520^* Internship in Technical Writing. 1-3 credits, maximum 6. Practice in writing appropriate documents such as proposals, manuals, software, hardware, reference, training, articles, functional specifications in job-simulation situations. Review of academic materials as appropriate.

533^* Seminar in Advanced Technical Writing. Specialized writing projects growing out of student's special interests and emphasizing the student's career preparation. Coverage of manuals, proposals, and visual aids used to communicate technical information.

554 Seminar in Scientific and Technical Editing. Managing technical documentation production; developing scientific and technical editing skills; special emphasis on editing project. Seminar in Early American Literature. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 17th and 18th centuries.

566 Seminar in American Literature of the 19th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 18th century.

568 Seminar in American Literature of the 20th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 19th century.

573 Seminar in Creative Writing: Fiction. Writing fiction at the professional level.

574 Seminar in Creative Writing: Poetry. Writing poetry at the professional level.

575 Seminar in Creative Writing: Scriptwriting. Scriptwriting at the professional level.

590 Special Problems. 1-3 credits, maximum 6. Investigating into a designated area of English leading to materials for creative component option (M.A.).


613 Studies in Creative Writing: Fiction. Prerequisite: 5733. Individual projects in fiction.

614^* Studies in Creative Writing: Poetry. Prerequisite: 5743. Individual projects in poetry.

615^* Studies in Creative Writing: Scriptwriting. Prerequisite: 5753. Individual projects in Scriptwriting.

620 Seminar or Directed Study. 1-6 credits, maximum 9. Specialized readings or independent studies.

620^* Studies in Fiction. 3 credits, maximum 6. Selected work in fiction, for example short fiction, contemporary short fiction, contemporary novel.

623^* Studies in Poetry. 3 credits, maximum 6. Selected work in poetry, for example modern poetry and contemporary poetry.

624^* Studies in Drama. 3 credits, maximum 6. Selected work in drama, for example American, British, Tudor-Stuart, pre-Shakespearean.

625^* Studies in New Media. Selected work in new media, for example film, literary adaptation to film, film and television.

6260 Studies in Literary Criticism. 3 credits, maximum 6. Selected work in literary criticism, for example ancient and neo-classical, 19th century, 20th century.

6500^* Seminar in Technical Writing. 1-3 credits, maximum 6. Selected topics in technical writing.

ENTOMOLOGY (ENTO)

2001 (N)Introduction to Entomology. Lab 4. Basic morphology, physiology and development in lecture and insect order recognition in the laboratory.


3022 (N)Apiculture. Biology of the honeybee and other bees.


3353 Field Crop Insects. Lab 2. Prerequisites: 2001, 2201. Life histories, ecology and control of insects injurious to field and forage crops.

3463 (N)Forest Insects. Lab 2. The biology and control of insects injurious to shade tree, forest and forest products.


412^* Household and Structural Pests. Lab 4. Prerequisite: 2201 or 3553. Classification and practical work on control of insects and rodents in dwellings, warehouses and other commercial establishments.


4523 Principles of Pest Management. Lab 2. Prerequisite: 3112 or 3332 or 3553. Modern concepts of pest regulation and the influence of alternatives on the agrosystem and economics of crop production. Identification of economically important insect pests in the Southwest.

4800 Undergraduate Traineeship. 1-5 credits, maximum 5. Prerequisite: consent of instructor. Participation in research or extension pest management programs of Departmental faculty.

4854 Medical and Veterinary Entomology. Lab 4. Prerequisite: 3553. Biology and control of insects affecting public health.

491 Pesticides in the Environment. Prerequisites: BISC 1403, CHEM 1225. A discussion of pesticides (chiefly fungicides, insecticides, herbicides and nematocides), including potential movement, degradation, fate and significance in the environment. Same course as AGRON 4913 and PLP 4913.
ENVIRONMENTAL SCIENCE (ENVIR)

5000 Research for Thesis or Report. 1-6, maximum 6. Prerequisites: approval of advisory committee and departmental steering committee. Research leading to master's thesis or report.

5103 Environmental Problem Analysis. Required for environmental science option. Multidisciplinary team investigation of environmental problems. Problem formulation, review of applicable theory from different disciplines, data collection from field, library, and laboratory, mathematical modeling and application of appropriate techniques of analysis to selected environmental problems and environmental impact assessments.

5300 Seminar in Environmental Science. 1-3 credits, maximum 6. Selected environmental problems, individual research, seminar reports and group discussion of readings.

6000 Research for Dissertation. 1-12 credits, maximum 24. Prerequisite: approval of advisory committee and departmental steering committee. Research leading to the Ph.D. dissertation.

FAMILY RELATIONS AND CHILD DEVELOPMENT (FRCD)

2003 (S)Human Development Within the Family: A Lifespan Perspective. Human development within the family system from a lifespan perspective. Principles of development and dynamics of behavior and relationships. Directed observation.

2113 Human Sexuality and the Family. Sexual development emphasizing personal adjustment and interaction within family and culture.

2611 The Professional in Family Services. Prerequisite: HEC 1111 or equivalent. Builds skills in decision-making, priority-setting, self-assertion, and self-assessment. Volunteer and field experience options available in the field of family services.

3013 (S)Adulthood: Early Years. Prerequisite: 6 credit hours in FRCD, sociology or psychology. Study of the unique characteristics of human development during youth and early adulthood. Emphasis on individual behavior and personal relationships as one establishes oneself as an adult. Focus on factors having an impact upon the individual, family, peer and intimate relationships, parenthood, vocational and career development. Application to personal experience.

3112 Parent-Child Relationship. For parents, teachers or others who expect to be responsible for young children. Increases understanding of the needs and feelings of both the developing child and the adult caregiver. A wide variety of philosophies and techniques explored out of which individuals can devise their own comfortable, effective parenting styles.

3143 (S)Marriage. Consideration of courtship and marriage with special emphasis on building a healthy paired relationship; communication and decision making; and coping with such problems as money, sex, role taking, in-laws and children.

3213 Child Development and Guidance: Early Childhood. The physical, social, emotional and cognitive development of the young child. Utilization of this information in creating appropriately nurturant environments and devising effective guidance strategies. Directed observation in preschool laboratories.

3220 Early Childhood Education Practicum. 1-4 credits, maximum 4. Participation in the Child Development Laboratories. Experiences related to guidance, activities and program planning.

3233 Early Childhood Education: Program Development. Creating learning environments that facilitate children's physical development; skills in communication, inquiry, creative expression, and interpersonal relations; cognitive development; and emotional development. Planning, implementing, and evaluating developmentally appropriate integrated learning experiences.

3251 Child Development and Guidance: School Age. Influence of the family experience on the physical, intellectual, social and emotional development of children in the school and pre-adolescent years. The role of parents, teachers and community leaders. Application of principles of development and guidance in actual work with children.

3303 Early Childhood Education: Play, Art and Music. Prerequisite: course in child development. Consideration of appropriate experiences in the areas of play, art and music for children under six. Observation and participation with children in the Child Development Laboratories and other groups.

3333 Child Development and Guidance: Adolescence. Development of the adolescent physically, socially, intellectually and emotionally with emphasis on the search for identity, heterosexual development, vocational choice and interpersonal relations. Observation of adolescents.

3403 Early Childhood Education: Literature and Language Arts. Prerequisite: 3213 or equivalent. Consideration of appropriate experiences in the areas of literature and language arts. Experiences with nursery school, kindergarten and other children's groups.

3503 Early Childhood Education: Science, Mathematics, and Social Studies. Prerequisite 3213 or equivalent. Study of appropriate experiences in physical and natural sciences, mathematics and social studies.

3613 Professional Services for Children and Families. Study of selected services for children and families.

3623 Fundamentals for the Helping Professional. Prerequisite: 3613. Development of fundamental skills and techniques used by those in various helping professions as viewed from the systems theory perspective. Observation and interviewing techniques, problem-solving and advocacy skills, and introduction to grant writing.

3753 (S)Family Development. Relationships over the life course within the American family. Variations in form and function of the family system related to cultural, economic, and social contexts.

3810 Practicum or Internship in FRCD. 1-9 credits, maximum 9. Prerequisites: 3213 and 3233, or 3613 and 3623. Observation and participation in programs for children, youth, adults and families. Supervision by FRCD faculty members or their designated representatives.

4023* Parent-School-Community Relationships. Prerequisite: senior or graduate standing. Effective ways for the home, school and the community to work together to provide for the optimum development of young children, including children from other cultures and ethnic groups.
413* Organizing and Administering Programs for Family and Young Children. Development, management, and evaluation of programs serving families and children.

4252 History and Philosophy of Early Childhood Education. Prerequisites: courses in child development and early childhood education and senior or graduate standing. History of early childhood education; theoretical foundations and methods of early childhood curriculum models, including multicultural and nonessential approaches; and current major issues in early childhood education.

4420 Preschool Teaching. 1-7 credits. maximum 7. Lab 3-21. Prerequisites: 3213, 3233, 3303, 3403, 3503, and pre-registration with director of Child Development Laboratories. Preschool teaching with responsibility in nursery-school-kindergarten groups.


4533 Adulthood: Middle Years. Study of the unique characteristics of life between young adulthood and the later years. Special emphasis on physical, intellectual, personal, family and career development in middle age.

4543 Adulthood: Later Years. Analysis of the aging process. Interrelationship between physical, psychological and social development in later years.

4673* Theories and Issues in Family Relationships. Prerequisite: 3753 or equivalent. An introduction to family theory. Current research and issues related to family dynamics, relationships, and crises within the context of the family system.

4743 Seminar in Research Methodology in Family Relations and Child Development. Understanding research processes and development of skills needed to be consumers of scientific literature in FRCD. Includes practice in reading and analyzing scientific literature, introduction to how computers are used in this research and demonstration of basic principles of assessment in children and families.

4793* (I) The Family: A World Perspective. Family structure and interaction that transcend specific cultures or nationalities; historical perspectives; and examination of specific cultural and national examples of family forms.

4811 Seminar in Family Services. Prerequisite: HEC 3113 or concurrent enrollment. Prerequisite: concurrent enrollment in HEC 5102. Current and teaching aids in teaching family relations, personal, family life, child development or human development.

5110* Research Developments in FRCD. 1-3 credits. Maximum 3. Prerequisite: concurrent enrollment in HEC 5102. Current development and needs in research in FRCD including application of research methods to FRCD and research planning.

5120 Computer Applications and Analysis in FRCD Research. Creating variable codebooks, coding data for input and output data for computer analysis using the SPSS-SX package. No computer experience necessary.

5213* Child Behavior and Development. Consideration of theory and significant areas of research that contribute to the understanding of child behavior and development.

5243* Family Crises and Resources. Crises and special problems encountered in family living; individual and community resources pertinent to them.


5323 Issues in Family Studies. Prerequisite: 3753. Current and classic literature in family studies. Consideration of philosophical bases and current research issues relevant to the family as a field of study.

5363 Material and Premarital Enrichment Education. 2-3 credits. maximum 3. Analysis of varieties of couple relationships and educational models that enable couples to enrich their relationships. Techniques for analysis and treatment of interpersonal problems through study of case materials. Classroom experience includes simulation of counseling and educational processes.

5443 Early Childhood Education: Theory and Practice of Group Programs. Prerequisites: 3303, 3404, 3503. Daily and long-range curriculum development for children under six in relation to age needs, individual development, and equipment and physical facilities.

5470* Developments and Innovations in Family Relations, Child Development and Early Childhood. 1-9 credits. Maximum 9. Analysis of current developments and innovative practices in one or more of the specified areas. Emphasis upon evolving concepts with implications for programs serving societal needs in these areas.


5543 Coping with Family Crises: Illness, Death, Divorce and Other Crises. Strategies for helping families deal with various family crises including illness, death and divorce. Focus on dealing with these from a family systems approach.

5590* Practicum in FRCD. 1-12 credits. Maximum 12. Prerequisites: 5593. ABSED 5562. Supervised experience in one of the following: Family Science Center working with families, or other relevant placements.

5593* Systems Theory and Applications to the Family. Examination of the cybernetic roots and terminology used with general systems theory providing an understanding, appreciation and integration of the role of “systems” approaches to family theory and clinical practice.


5880* Early Childhood Education: Administration. 3-9 credits. Maximum 9. Administration of programs for young children including consideration of information base for decision-making, aspects of effective organization and functioning and evaluation of policies and procedures.


5983* Theories of Child Behavior and Development. Prerequisite: 8 credit hours at graduate level in child development or related areas. Major theories and supportive research that contribute to the understanding of child behavior and development.

5993 Theories of Family Relationships. Prerequisite: 6 credit hours at graduate level in family relationships. Theoretical configurations and current conceptual framework in family relationships. Overview of theory construction.

6000* Doctoral Thesis. 1-12 credits. Maximum 30. Prerequisite: consent of major professor. Research in home economics for the Ph.D. degree under supervision of a graduate faculty member.

6110 Research Problems in Family Relations and Child Development. 1-9 credits. Maximum 6. Prerequisite: consent of instructor. Special research studies under the supervision of a graduate faculty member.

6250* Seminar in Child Development. 1-6 credits. Maximum 6. Prerequisite: 5213 or equivalent. Selected topics in child development with special attention given to recent research literature and current theory.

6350 Seminar in Family Studies. 1-6 credits. Maximum 6. Prerequisite: 5323 or consent of instructor. Current research and theory in the family area; selected topics.

6783 Advanced Research Methods in Family Relations and Child Development. Prerequisites: one course in research methods and one in statistics. Research design and analysis of data in the areas of family relations and child development.


6993* Analysis and Application of Family Theory. Prerequisite: 5993. Family theory process, including logic, theory construction, and relating conceptual orientations to current research areas.

FINANCE (FIN)

2123 Personal Finance. A first course in the management of the individuals financial affairs. Budgeting, use of credit, mortgage financing, investment and estate planning.

3113 Finance. Prerequisites: ACCTG 2203, ECON 2023, STAT 2303. Operational and strategic financial problems involving allocation of funds, asset management, financial information systems, financial structure, policy determination and analysis of the financial environment.

3613 General Insurance. Introduction to the theory and general principles of insurance. A broad analysis of the elements and operation of property, casualty, health and life insurance.

3623 Property and Casualty Insurance. Prerequisite: 3613. Emphasis on loss and the insurance contract from fire, marine, property damage, automobile and other liability and loss adjustment Rate formulation, social implications, government regulations and government regulation of the insurance industry.

3633 Life and Group Insurance. Prerequisite: 3613. Principles of insurance applied to life and human values. Group plans in industry, with coverage emphasizing the managerial point of view.

3713 Real Estate Investment and Finance. Prerequisite: 3113. An introductory course in real estate investment and finance. Financing real estate, real estate financial leverage and financial planning, the institutional structure of mortgage lending, managing risks, investment strategies and decisions.

3813 Trust and Estate Management. Prerequisites: 3113, ACCTG 2203, BUSI 3123. Overview of trust and estate management from the point of view of a trust officer in a commercial bank. Emphasizes the need of financial managers for an understanding of problems, patterns and trends in trust and estate management.

4213* International Financial Management. Prerequisite: 3113. Financial problems of multinational corporations. Designed to develop a sound conceptual understanding of the environmental factors that affect decisions of financial managers; to extend the current developments in the theory of financial management to incorporate variables peculiar to international operations; and to formulate financial strategies under different business systems and ideologies.

4223 Investments. Prerequisite: 3113. Various approaches to selecting and timing investment opportunities, e.g., common stocks, bonds, commodities and options. Modern concepts of portfolio theory.

4333* Financial Management. Prerequisite: 3113. Theories and practice applicable to the financial administration of a firm. A variety of teaching methods used in conjunction with readings and cases to illustrate financial problems and techniques of solution.

4443 Banking Strategies and Policies. Prerequisites: 3113 and ECON 3313. Theories and practices of bank asset management; banking markets and competition.

4550 Selected Topics in Finance. 1-6 hours credit, maximum 6. Prerequisite: 3113. Advanced topics in finance. Topics are updated each semester.

4613 Risk Management. Prerequisite: 3613. Elements of corporate risk control and management.

5123* Investment Theory and Strategy. Prerequisite: 5353. Selected investment topics and advanced portfolio management techniques.

5243 Financial Markets. Prerequisite: 5353. An analysis of the structure of financial markets, the determination and behavior of interest rates, the functioning of financial institutions, the nature of financial market instruments, and the flow of funds.

5353 Theory and Practice of Financial Management. Prerequisite: ACCTG 5103. Concepts and theories applicable to the financial administration of a firm. Cases, problems and readings to illustrate various financial problems and techniques of solution.

5460* Seminar in Finance. 3-6 credits, maximum 6. Prerequisite: consent of instructor. Advanced research with emphasis on theoretical problems and solutions. Selected topics covered.

5513* Theory of Finance. Prerequisite: 5353. Development of theoretical structure of financial decisions beginning with case of certainty and moving to uncertainty models. Fundamental decisions of investment, financing, and production within the context of economic theory of choice and capital market equilibrium.

5550* Special Topics in Finance. 1-6 credits, maximum 6. Prerequisite: 5353. Theoretical and applied aspects of specialized financial areas. Evaluation of models, current trends and problems.

5613* Corporate Financial Planning. Prerequisite: 5353. Financial planning in a systems framework. An integration of existing financial theory and practice. Financial planning systems allowing the manager to acquire an overview of the various functions of the firm; to examine alternative courses of action with speed and thoroughness; to reduce the response time in reacting to change in the environment and to improve future decisions by learning from feedback of previous decisions.

**FIRE PROTECTION AND SAFETY TECHNOLOGY (FIRET)**

1013 Introduction to Loss Control and Risk Management. Lab. Basic concepts and methodologies from the fields of fire protection, occupational health, occupational safety and radiation health.

1213 Fire Safety Hazards Recognition. Lab. 3. “The Fire Problem” (FIRET 4333) and “Systems Engineering” (FIRET 4213) and their relationship to loss of property and/or life. Safe storage, transportation and handling practices to eliminate or control the risk of fire in the home, business and industry.

1373 Fire Suppression and Detection Systems. Lab 3. The design, installation, maintenance and utilization of portable fire-extinguishing appliances and pre-engineered systems. Operational capabilities and utilization requirements of fire detection and signaling systems. Fire detection and suppression applied in practical laboratory problems.


1683 Industrial Loss Prevention. Lab 3. Prerequisite: 1213 or consent of instructor. Specific industrial processes, equipment, facilities and work practices for detecting and controlling potential hazards.

2013 Electrical Safety Codes. Lab. 3. Prerequisites: EET 2213, MATH 1613. Safety-oriented design, installation, operation and maintenance of electrical power distribution systems based on current electrical codes and safety standards.

2143 Structural Designs for Fire and Life Safety. Lab. 3. Prerequisite: CHEM 1013. Building construction standards and codes to assure maximum life and property safety from fires, explosions and natural disaster. Egress design specifications, occupancy and construction classifications and fire protection requirements for building construction and materials.

2153 Fire Protection Management. Prerequisite: prior or concurrent enrollment in all other fire protection courses. Applied human relations, technical knowledge and skills for achieving optimum effectiveness from a fire protection organization.

2243 Automatic Fire Suppression Systems. Lab. 3. Prerequisite: 1373 and MATH 1613. Detailed current standards for selection, design, installation, operation and maintenance of automatic fire suppression systems. Laboratory problems on applicable technological principles.

2483 Fire Protection Hydraulics and Water Supply Analysis. Lab. 3. Prerequisites: 1373 and MATH 1513. Fluid flow through hoses, pipes, pumps and fire protection appliances. Water supply and distribution analysis using hydraulic calculations. Testing techniques to detect anomalies in design or performance capabilities.

3013 Industrial Safety Organization. Survey course. Recognition, evaluation and control of occupational health and safety hazards. Accident prevention, accident analysis, training techniques, workman’s compensation insurance, guarding and personal protective equipment.

3023 Occupational Safety Techniques. Lab. 3. Prerequisite: 3013. Occupational safety in the field and equipment and their inherent hazards. Directed towards worker, machine and environmental control.

3113 Advanced Extinguishing Systems Design and Analysis. Prerequisites: 2483, 2243. Automatic fixed fire extinguishing systems drawings. Emphasis upon computer assistance through use of existing design programs.

3222 Industrial Security Applications. Safeguarding of industrial property, personnel and proprietary information.

3233 Radiological Safety. Lab. 2. Ionizing radiation problems; detection and measurement, shielding and exposure limiting, radiation health aspects, storage, handling and disposal.

3713 Hydraulic Design of Automatic Sprinkler Systems. Prerequisites: 1573, 2483, MATH 1513. Hydraulic calculation technique for the design and analysis of automatic sprinkler fire extinguishing systems.

3723 Industrial Fire Pump Installations. Prerequisites: 2483, MATH 1513. Applications, design and analysis of industrial fire pump installations. Graphical analysis of fire pump contributions to existing fire protection water supply systems emphasized.

3733 Sprinkler System Design for High Piled and Rack Storage. Prerequisites: 2243, MATH 1513. Specific design techniques for sprinkler system protection of commodities stored in solid piles or racks over 12 feet in height.

4050 Advanced Fire Protection and Safety Problems. 1-4 credits, maximum 6. Prerequisite: consent of department head. Special technical problems in fire protection and safety.

4123 Advanced Fire and Safety Problems. Selected problems in the fire, occupational safety, occupational health and industrial security areas. Research or state-of-the-art technologies to prevent or correct such problems.

4133 Industrial Hygiene Instrumentation. Lab 3 Prerequisites: CHEM 1515 and PHYS 1114. Description, operation and application of quantitative instruments in general use in industrial hygiene.

4224 Elements of Industrial Hygiene. Lab. 3. Prerequisites: CHEM 1515 and junior standing. Toxics or irritating substances, physical, biological and ergonomic and other occupational stress factors causing employee illness or discomfort. Environmental pollution sources and controls.

4333 System Safety Management. Lab. 3. Prerequisite: prior or concurrent enrollment in all other fire/safety subjects. Fire/safety techniques to recognize, evaluate and control potential occupational hazards. Critical path, LAD, PERT and human factors concepts.

4403 Hazardous Materials Incident Management. Lab. 3. Prerequisites: 3013, CHEM 1515. An interdisciplinary approach to hazardous materials incident management. Legislative requirements. Emphasis on comprehensive safety and health program compliance relating to hazardous materials incidents or waste sites. Regulatory code and standard activities, transport-related inspections, incident modeling, and use of environmental safety software for problem solving and documentation.

**FOOD, NUTRITION AND INSTITUTION ADMINISTRATION (FNIA)**

1113 (N)Basic Human Nutrition. Functions of the nutrients in human life processes. Nutrition relationship to health as a basis for food choices Open to all University students.

2111 Professional Careers in Dietetics. Prerequisite: HEC 1111 or concurrent enrollment. Career opportunities in dietetics. Roles, responsibilities and professional expectations of dietetics professionals. Routes to professional memberships and current issues in professionalism.

2113 Introductory Food Preparation and Management. Lab. Selection, preparation, management and service of food.
2123 Fundamentals of Dining Room Management. Lab 3. Prerequisites: 2113 or equivalent. Experience in organizational and management of table and beverage service in varied food service settings. Same course as HRAD 2123.

3133 (L)Science of Food Preparation. Prerequisites: 2113 or equivalent. Laboratory. Application of scientific principles to food preparation. Same course as HRAD 3133.

2121 Management in Hospitality and Food Service Systems. Prerequisite: a course in economics. Function and methods of management as related to the hospitality and food service industries. Same course as HRAD 2121.

3333 Nutrition and Dietsetics. Prerequisites: 1113, organic chemistry, physiology. Metabolism of nutrients; their role and function in the human living organism and the further application to selection of diet.

3440 FNIA Practicum. 1-3 hours, maximum 3. Supervised work experience in a food service or health care facility.

3543 Food and the Human Environment. Impact of the various factors which affect food availability, production, processing, distribution and consumption of food in the world. Challenges and solutions to the world food crisis.

3552 Purchasing in Hospitality and Food Service Systems. Lab 2. Prerequisite: 3133 or concurrent enrollment. Procurement of food and nonfood materials in hospitality and related industries. Same as HRAD 3552.

3692 Food Conservation and Preservation. Lab 3. Prerequisites: 3133, organic chemistry, microbiology. Modern methods and principles of food conservation and preservation including freezing techniques; laboratory experience with different methods.

3851 Dietsetics as a Profession. Identification of changing roles, applications and responsibilities and professional expectations of dietetic practitioners by practice level and substantive category. Professional organizations, routes to membership in the American Dietetic Association; accreditation, licensure and other aspects of the profession.

4013 Experimental Foods. Lab 6. Prerequisite: 3123 or consent of instructor. Investigations in physical, chemical and sensory qualities of foods under experimental conditions. Development of an individual research project.

4113 Nutrition in Disease. Prerequisites: 3333; one biochemistry course; concurrent enrollment in practicum. Physiological and metabolic bases for dietary modifications in disease. Interpretation of laboratory data as it applies to nutritional care.

4223 Nutrition in the Life Cycle. Prerequisites: 1113 or equivalent. Nutritional needs and dietary concerns of individuals from conception through old age.

4333 Food, Beverage and Labor Cost Controls. Prerequisites: ACCTG 2203, junior standing or consent of instructor. Food, beverage and labor cost control systems associated with hospitality industry operations. Same course as HRAD 4333.

4363 Quantity Food Preparation Management. Lab 4. Prerequisites: 2123, 3133, 3552, a course in accounting or mathematics or consent of instructor. Organization, purchasing, preparation and service of food for large groups. Same course as HRAD 4363.

4372 Creative Teaching of Nutrition. Prerequisite: a course in nutrition. Techniques for development and presentation of nutrition information that will motivate people of various ages to improve their food habits, identification and development of teaching aids.

4573 Institution Organization and Management. Lab 3. Prerequisite: FNIA 3553 or HRAD 4573. The organization of personnel and resources in a food service institution and the techniques required by the manager. Lab consists of work experience in Residence Hall Food Services. Same course as HRAD 4573.

4641 Seminar in Food and Nutrition. Prerequisite: upper-division standing. Reading and reporting on various topics in food and nutrition. Emphasis on interpreting journal articles and research results. Open to all upper-division University students.

4693 Institution Administration. Lab 3. Prerequisite: 4573 or concurrent enrollment. Supervised administrative responsibilities in food services and related institutions such as hotels. Same course as HRAD 4693.

4733 Community Nutrition. Prerequisite: 1113 or equivalent. Application of nutrition, management, education and communication principles to community nutrition programs and services. Field work required.

4850 Special Unit Course in Food, Nutrition and Institution Administration. 1-6 credits, maximum 6. Prerequisite: approval of adviser. Individual research and thesis that will fulfill the requirements for the master's degree.

5012 Public Policy Development in Food, Nutrition and Related Programs. Rationale underlying selected government programs in food and nutrition and other home economics areas and assessment of the effectiveness of the programs.

5113 Research Developments in FNIA. 1-3 credits, maximum 3. Prerequisite: concurrent enrollment in HEC 5102. Current developments and needs in research in FNIA including application of research methods to FNIA and research planning.

5113* Investigational Cookery. Prerequisite: 4013. Food science, food quality and physical characteristics of foods.

5230 New Findings in Nutrition. 1-3 credits, maximum 6. Prerequisite: 1113. Current emphases in nutrition, with implications for nutrition research, education, and public service.

5253* Quantity Food Development. Lab 5. Prerequisite: 4363 or equivalent. Experimental approach to methods in quantity food production as related to time factor, institutional equipment and proportions of ingredients.

5343 Organization and Management of Food Service Systems. Prerequisite: 4573 or equivalent. Contemporary theories of organizational structures as applied in the management of foodservice systems.

5363 Maternal and Infant Nutrition. Prerequisite: 1113 or equivalent. Nutritional needs and dietary concerns during pregnancy, lactation and the first year of life. Implications for nutrition intervention and education.

5373 Childhood Nutrition. Lab 6. Prerequisite: 1113 or equivalent. Nutritional needs of children, preschool through elementary school years. Dietary implications for child care, school food service and parent education.

5368 Nutrition for the Adolescent and Young Adult. Prerequisite: 1113 or equivalent. Nutritional needs and dietary concerns during adolescence and young adulthood. Implications for nutrition education and research.

5393 Nutrition for the Elderly. Prerequisite: 1113 or equivalent. Nutritional needs and dietary concerns of the elderly. Implications for food and nutrition programs, policies, research and education.

5462 Food Service Layout and Equipment. Prerequisite: HRAD 4472. Food service layout and specifications for institutional equipment.

5463 Advanced Human Nutrition. Prerequisites: a biochemistry course and an upper-level nutrition course. Application to the human being of metabolic processes which involve essential dietary components.

5593 Food Service Systems Management I. Prerequisite: 4543. Consideration of advanced administrative problems. Case studies in food service systems.

5613 Organization and Management of School Lunch Rooms. Lab 2. Prerequisite: 4363 or equivalent experience in operation of school lunchrooms. Organizing and equipment and operation of school lunchrooms. Special problems required.

5650* Advanced Food Conservation and Processing. 2 credits, maximum 2. Prerequisite: 4013. Recent advances in food processing in relation to quality of product and conservation of food nutrients.

5673 Food Service Systems Management II. Lab 3. Prerequisite: 5463. Advanced work experience in food service systems management in the procurement, development, maintenance and utilization of an effective and satisfied working force in food service systems.

5743 Experimental Methods in Food and Nutrition Research. Prerequisites: a course in biochemistry, a course in statistics, a graduate course in food or nutrition. Experiment al design for research in food and nutrition based on analytical laboratory techniques and other research methodology.

5753 Administrative Dietsetics. Organizing and managing food service systems as indicated in Competencies for the Dietetic Internship. Includes leadership competence, professional development, interpretation of research, implementation of change, financial planning and computer applications. Dietetic interns enroll concurrently with the internship; open to other FNIA graduate students.

5800 Food, Nutrition and Institution Administration Workshop. 1-3 credits, maximum 4. Prerequisite: graduate standing. Selected phases of food nutrition and institutional administration.

5870 Problems in Food, Nutrition or Institution Administration. 1-4 credits, maximum 9. Newer problems and methods in food, nutrition or institutional administration; animal experimentation or other research.

5960* Food, Nutrition and Institution Administration Seminar. 1 credit, maximum 2. Prerequisite: for M.S. students. Individual reports and group discussion of current issues in food, nutrition and institution administration.

6000* Doctoral Thesis. 1-12 credits, maximum 30. Prerequisite: consent of major professor.

6113 Critical Analysis of Current Research in FNIA. Prerequisites: graduate standing in FNIA, 3333 and 5463 or equivalent, or consent of instructor. Recent research relevant to issues in food, nutrition and institution administration.

6870 Independent Study in FNIA. 1-3 credits, maximum 6. Selected areas of study in human nutrition or food service systems management for advanced graduate students working toward doctorate degree.

6960* Seminar in Food, Nutrition and Institution Administration. 1 credit, maximum 3. Oral presentations of research papers and group discussions of recent literature and findings in food, nutrition and institution administration. Doctoral level.

FOREIGN LANGUAGES AND LITERATURES (FLL)

The Department of Foreign Languages and Literatures offers courses under the prefix FLL, and in the following languages each of which has its own prefix: Chinese, French, German, Greek, Japanese, Latin, Russian and Spanish. These languages are listed in alphabetical order of prefix.

1000 (i) Special Studies in Foreign Language and Literature. 1-10 credits, maximum 10. Special studies in areas not regularly offered; basic level.
FORESTRY (FOR)


2134 Dendrology. Lab 4. Prerequisite: BISC 1403. Identification, taxonomy and distribution of forest trees and shrubs of the United States; environmental requirements and utilization.

2773 Timber Harvesting. Timber harvesting systems, planning, equipment, and planning, including topics in timber procurement, timber sales, harvest economics, logging safety, environmental considerations, and industrial operations.

3001 Multiple Use of Forest Resources. Prerequisite: 2773. One-week segment of an 8-week summer field session. Management of regional forest resources, including wildlife, watershed, range recreation, and timber.

3002 Silvics and Field Silviculture. Prerequisites: 2134, 2773, BISC 1304 and 1403. Two-week segment of an 8-week summer field session. Study of forest ecological relationships; examination and measurement of site productivity and stand dynamics, examination of current silviculture practices in major forest regions of North America.

3004 Forest Measurements I. Prerequisites: 2773, MATH 1715 and STAT 2013. Four-week segment of an 8-week summer field session. An introduction to the measurement of forests, forest products, standing trees, growth, and the application of mensurational techniques to timber evaluation and analysis.

3011 Harvesting and Utilization. Prerequisite: 2773. One-week segment of an 8-week summer field session. Descriptive role of timber harvesting and forest products utilization in forest management including demonstrations, tours to logging operations and manufacturing facilities, and participation in field practices.

3201 Forest Surveying. Prerequisite: MATH 1715. First week of an 8-week summer field session. An introduction to the art and science of forest field surveying, including the design of old property lines, data gathering for topographic maps, traversing, and forest road layout.

3223 Silviculture. Lab 3. Prerequisite: 3413. Principles and techniques of natural and artificial regeneration, inter- and post-planting treatments, and silvicultural systems applicable in various forest cover types.

3333 Fire Management. An introduction to the unique role of fire in the forestry enterprise; chemistry and physics of fire, fire weather, impact of fire on ecosystems, and systems developed to make fire-related decisions.

3413 Forest Ecology. Lab 3. Prerequisite: 3002. Study of the forest as a biological community with emphasis on the interrelationships between trees, other organisms comprising the community and the physical environment.

3443 Forest Genetics and Tree Improvement. Prerequisite: 3413. A study of mechanisms of inheritance, types of genetic variance, the development of natural populations, variation patterns, genetic improvement systems, and forest tree improvement methods as part of forest and nursery management systems.

3554 Wood Properties. Lab 2. Prerequisite: 3011. Structure, properties, identification of wood; treatment of forest products.

3643 (N)Forest Environment and Related Resources. The interrelationships and uses of the soil, water, weather, wildlife, life, range resources and recreational environment for man's benefit. No credit for forestry majors.

3663 Forest Measurements II. Lab 2. Prerequisites: 3004 and an introductory course in computer programming. The application of statistical methods to forestry problems including stand volume estimation, growth measurement, and volume table construction. Introduction to the use and significance of forest yield tables in forest management. Applications of microcomputing to analysis of forestry data.

3882* Aerial Photogrammetry. Lab 3. Prerequisite: MATH 1613. Use of aerial photographs in natural resources fields. Study of scale, parallax, planimetric mapping and photo interpretation.

3993 Forest Economics and Finance. Prerequisite: 3001, 3004, 3011, 3663 and AGEC 1114. Economic factors and policy affecting forest resource management; factors affecting the production of wood products; arithmetic of interest and investment criteria; economics of nonprofit goods.

4103* Wood Treatments and Preservation. Prerequisite: 3554. Industrial treatment of wood with respect to drying, adhesion, protective coatings, resistance to decay, and dimensional stability.

4113* Forest Products. Prerequisite: 3554. Production, distribution and uses of major forest products.

4223 Timber Management. Lab 2. Prerequisites: 3223 and 3993. Regulation of forest growing stock to meet market demand for forest products. Management of forest enterprises, forest resource management, and organization of the forest enterprise to meet financial objectives of management. Four-day field trip may be required.

4333* Forest Resource Management: Planning and Decision Making. Lab 2. Prerequisites: 4223 and COMSC 2113. Applications of mathematical and statistical models in planning forest resource management problems. Integrated case studies to synthesize economic, mathematical, biological, political and administrative principles.

4443* Forest Administration and Policy. Prerequisite: senior standing. Forest policy and legislation; personnel matters, organization, supervision and financing of federal, state and private forest enterprises.

4500 Forest Problems. 1-3 credits, maximum 3. Prerequisite: upper division standing, GPA of 2.50 or better and consent of instructor. Selected problems in forestry.

4533 Forest Recreation. Prerequisite: senior standing. Forest administration and the agencies involved in administering such areas; their policies and management programs and the impact on the recreation resource. Emphasis on the public sector but the private sector also covered.

4563 Tree Physiology. Prerequisites: 3413 and 3554. The physiology of growth, development and responses of woody plants with particular consideration of the influence of genetic and environmental factors on physiological processes in trees; application of physiological principles in predicting the effects of silvicultural practices on tree growth response.

4610* Contemporary Issues in Forest Policy. Prerequisite: senior standing. Current issues in forest policy, public land allocation and use, alternatives for nonindustrial private forestlands, current legislation pertaining to forest resources, etc. A reading/discussion format is scheduled in the evenings at participants' homes. Enrollment limited.

4613 Forest Biometrics. Lab 2. Prerequisites: 3663 and MATH 2713. Application of mathematical and statistical methods to the unique characteristics of forest trees and stands. Development of models for individual tree taper and volume. Theory and development of growth and yield models.

4811* Forest Hydrology Laboratory. Lab 2. Prerequisite: 3663. An introduction to the hydrologic processes and characteristics of forest and other wildland watersheds: precipitation, runoff, infiltration, overland and in-channel processes. Water quality assessment in wildland settings.

4813* Forest Watershed Management. Prerequisite: senior standing. Hydrologic process and characteristics of forest and range watersheds; management principles and techniques for improving water yield and quality; watershed protection and rehabilitation.

5000 Research and Thesis. 1-6 credits, maximum 6. Open to students working for a Master of Science degree in forest resources.

5003 Productivity of Forest Stands. Lab 2. Prerequisites: 3663 and AGRON 2124, STAT 5013 or equivalent. Integrated study of the ecological, and genetic factors controlling the productivity of forest stands. Analysis of natural, economic and social factors influencing silvicultural treatment of forest stands. Tree and stand response to silvicultural manipulation.

5010 Graduate Seminar. 1 credit, maximum 2. Presentation of current and new concepts in forest land management and research techniques for their investigation. Required for the Master of Science degree.

5030 Advanced Forestry Problems. 1-3 credits, maximum 9. Individual problems in advanced forestry subject-matter appropriate to students with capability at the master's level.


5043* Forestry Research Methods. Methods used in forestry research; choice of biological materials and species; experimental design in forestry, analysis of forest data and interpretation of results for integrative forest.

5143* Economics of Multiple Uses of Forests. Prerequisite: 3993. An introductory course for forest resource management students. Determination of the impact of market and nonmarket factors on forest use decisions. Development of demand and supply models for market and nonmarket forest goods.

5753 Forest Genetics. Prerequisites: 3443 and ANSI 3423 or approval. An introduction to the genetic basis for population growth in forest trees. Estimation and application of genetic parameters to developing improved tree populations. Development of selection indices and experimental design as related to applied tree breeding programs.
FRENCH (FRNCH)

1115 (I) Elementary French I. Lab 1 1/2. Main elements of grammar and pronunciation, with work on the four basic skills of listening comprehension, speaking, reading and writing.

1225 (I) Elementary French II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1115.

2112 (H) Intermediate Reading and Conversation I. Lab 1. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Reading and discussion of simpler French texts, mostly cultural. May be taken concurrently with other 2000-level French courses.

2113 (H) Intermediate French I. Lab 1. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Review and further presentation of grammar and pronunciation; consolidation of basic skills, with additional emphasis on writing. May be taken concurrently with other 2000-level French courses.

2222 (H) Intermediate French II. Lab 1. Prerequisite: 2113 or equivalent competence. (May have been gained in high school.) Reading and discussion of more advanced French texts, mostly literary. May be taken concurrently with other 2000-level French courses.

2223 (H) Intermediate Reading and Conversation II. Lab 1. Prerequisite: 2112 or equivalent competence. (May have been gained in high school.) Reading and discussion of more advanced French texts, mostly cultural. May be taken concurrently with other 2000-level French courses.

3013 French for Reading Requirements I. Translation of French readings into English.

3023 French for Reading Requirements II. Prerequisite: 3013. Translation of French readings into English.

3073 French Conversation. Prerequisite: 20 hours of French or equivalent. Colloquial speech, with discussion of French newspapers and magazines. Practice in brief public address in French.

3203 (I) Advanced Written Expression. Lab 1. Prerequisite: 20 hours of French or equivalent. Practice in composition and stylistics, designed to bring students up to a high level of proficiency in writing. May be taken before or after 3212.

3212 (H) Advanced Grammar. Lab 1. Prerequisite: 20 hours of French or equivalent. May be taken before or after 3203.

3343 (I) Business French. Prerequisite: 2223 or equivalent. Applied for students in commercial and technical fields. Overview and strategies of business and economic climate in France.

3463 (I) Advanced Diction and Phonetics. Lab 1. Prerequisite: 20 credit hours of French. Required course for teacher certification. French speech sounds and intonation patterns, with practice to improve the student's pronunciation.

3853 Introduction to Analysis of French Literature. Prerequisite: 20 hours of French or equivalent. Close reading of shorter texts in a variety of literary genres, with presentation of French versification and literary terminology.

3902 (H) Orientation to Internship Abroad. Prerequisites: 1225 or equivalent French or equivalent proficiency. Preparatory course for summer practicum in French-speaking country.

3903 (H) Internship Abroad. Prerequisite: 3902. Practical studies in a French-speaking country. Supervised research papers and reports, and oral testing, during and following the practicum.

4113 (H) French Literature in Translation. Cultural and humanistic significance of French literature; reading and discussion of selected complete works, using combined lecture, discussion and seminar approaches. Independent tutorial study encouraged for part of course. Taught in English.

4153 History of French Literature I. Prerequisite: 20 credit hours of French or equivalent. Historical survey of French literature before 1700, with reading of representative texts.

4163 History of French Literature II. Prerequisite: 20 credit hours of French or equivalent. Historical survey of French literature of the eighteenth century, with reading of representative texts.

4183 History of French Literature IV. Prerequisite: 20 credit hours of French or equivalent. Historical survey of French literature of the nineteenth century, with reading of representative texts.

4333 (H) Backgrounds of Modern French Civilization. Prerequisite: 20 credit hours of French or equivalent.

4550 (I) Directed Studies in French. 1-3 credits, maximum 9. Lab 1-2. Prerequisite: 20 credit hours of French or equivalent. Individual or group study of French language or literature.

4573 (H) Modern French Theater. Prerequisite: 20 credit hours of French or equivalent. Analysis of French plays from the 19th and 20th Centuries.

5110 Advanced Studies in French. 1-3 credits, maximum 9. Prerequisite: 15 credit hours of upper-division French discussion or research in specialized topics.

GENERAL ADMINISTRATION (GENAD)

3413 Consumer Issues in American Society. Prerequisite: ECON 1113 or 2123. The role of consumerism and its influence on business policies; the development of public and nonpublic consumer protection efforts; and personal and family financial planning and decision making, including budgeting, savings and investments, credit, buying problems and insurance.

4213 Administrative Strategies for Women in Business. Identification and analysis of the theoretical concepts and practical tools enabling a woman to demonstrate effectiveness in the business environment. Changing advancement opportunities for women, clarification of career goals, conflict management, delegation of authority, division of labor, decision making, motivation, supervision and analysis of executive styles.

4433 Business, Government and the Consumer. Prerequisite: ECON 1113 or 2123. Existing consumer protection programs, consumer legislation and consumer representation in local, state and federal governments, including methods of teaching.

GENERAL ENGINEERING (GENEN)

4010 Senior Design Project. 2-4 credits, maximum 4. Prerequisite: senior standing in General Engineering. Capstone design project through independent application of knowledge of engineering principles and concepts from the disciplines covered in earlier coursework.

5000 Thesis. 1-6 credits, maximum 6. Prerequisite: approval of major professor. Thesis or report.

5030 Engineering Practice. 1-12 credits, maximum 12. Professionally supervised engineering problem involving authentic projects for which the student assumes a degree of professional responsibility. Activities must be approved in advance by the student's adviser and may continue during summer experience on-campus or off-campus or both. Periodic reports both oral and written required as specified by the adviser.

5110 Senior Seminar. 1-6 credits, maximum 6. Prerequisite: approval of major professor. Independent or guided study in a topic area selected to enhance a student's program.

6000 Research and Thesis. 1-30 credits, maximum 30. Prerequisite: consent of graduate committee and approval of student's advisory committee. Independent research under the supervision of a member of the graduate faculty for students pursuing work beyond the master's level.

5110 Advanced Study. 1-12 credits, maximum 12. Prerequisite: for all advanced study courses. Advanced study and investigation under the supervision of a member of the graduate faculty parallel in interest and advanced to and supported by the 5000-series courses.

GENERAL TECHNOLOGY (GENT)

1031 Personal and Occupational Guidance. Orientation in job requirements of engineering technician occupations. Personality development and leadership training. Graded on pass-fail basis.


1113 Essentials of Mechanical and Architectural Drafting. Lab 3. Mechanical and architectural drafting conventions and practices in business and industry. Fundamental drafting skills and techniques: Interpretation and utilization of graphic media and engineering drawings in effective technological communications.

1153 Technical Drawing. Lab 6. Drawing and drafting room practices, procedures and techniques. Interpretation of typical industrial drawings. Students with two years high school drafting or one year practical drafting may substitute an advanced course in Mechanical Design Technology with the consent of their advisers.


1320 Technological Problems. 1-3 credits, maximum 6. Prerequisite: consent of instructor and adviser. Problems in advanced technology of particular interest to currently employed technicians.


2050 Advanced Technological Problems. 1-4 credits, maximum 6. Prerequisite: consent of instructor and adviser. Problems in applied engineering science that are of particular interest to the engineering technician.
3163 (N)Economic Geography. Processes significant to the spatial structure of economic systems. Production, consumption and exchange activities examined in regard to location, distribution, aerial differentiation and spatial interaction patterns. Attention given to processes of change as well as to steady states.

3253 (S)Conservation of Natural Resources. Problems and concepts of conservation of land, water, forests, wildlife, minerals and people.

3313 Cartography. Lab 2. Prerequisite: junior standing. Theory, design, and effective portrayal of data on maps.

3363 (I,S)Geography of Africa. General patterns of population and cultural heritage in Africa; focus on elements and patterns that contrast with Western civilization.

3513 (S)Geographical Geography. Major political structures and geopolitical implications of location, shape, area, culture and natural environment of nations and states. Spatial analysis of voting behavior.

3523 Geographical Concepts and Techniques I. Lab 2. Prerequisites: 1113 or 1114, and STAT 2013. Modern concepts and techniques for geographical research and analysis including data acquisition and manipulation from field and secondary sources.

3533 Geographical Concepts and Techniques II. Prerequisite: 3523. The utility and goals of geographic inquiry in the solution of problems including concepts of spatial structures, distributive processes, networks, interactions and areal associations.

3613 (S)Geography of the United States. A geographic analysis of the United States with emphasis on regional variations of social, economic and physical phenomena.

3633 Regional Analysis and Planning. An introduction to methods of examining and analyzing regions. Examination and interpretation of the spatial, social and ecological aspects of regional planning. Same course as ZOOL 3633.

3653 (S,SpD)Geography of Oklahoma. Geographic interpretation of physical, economic, historical and scenic features.

3723 (I,S)Geography of Western Europe. Location and analysis of natural, economic and cultural features of Western Europe.

3733 (I)Geography of East Europe and USSR. A regional analysis encompassing cultural, economic and physical features.

3743 (I,S)Geography of Latin America. Areal distribution and analysis of physical, cultural and economic features of Middle and South America.

3753 (I)Geography of Asia. Systematic interpretation of significant spatial patterns of man and natural environment. (Exclusive of USSR.)

3813 Historical Geography. The reconstruction of the historical landscape of selected regions from a geographical point of view. Spatial relationships recorded in journals and literature of the past in the light of the present. These materials related to present through sequential developments of patterns of spatial organization.


4003 Natural Hazards. Human perception of and response to extreme natural events (such as tornadoes, floods, earthquakes, drought and disease). Examination of mitigation and relief procedures at local, state and national levels.

4213* (N)Biometeorology. Prerequisite: 3033. Interrelation of meteorology and climate to botany, zoology, agriculture, forestry, transportation, and air pollution.

4113* Advanced Physical Geography. Lab 2. Emphasis on one or several specialized topics from the broad area of physical geography.

4123* Geographic Aspects of Urban Planning. Prerequisite: 3123. Spatial aspects of urban planning: development of planning theory, various planning tools, and specific problem areas such as urban renewal and urban transportation.

4163* Geography of International Economic Systems. Prerequisite: 2253 or 3163. Emphasis on international flows of goods and services resulting from differences in comparative economic advantages. International trade and production patterns from a geographic perspective. Resource use, transportation patterns, and levels of economic development.

4213 (S)Geography of Sport. Spatial analysis of sport; its origin and diffusion, geographical organization and regional variation. Geographical movements and interaction associated with sport. Application of geographical solutions for reorganization and reform. Focus on both U.S. and international scene.

4223 (H,S)Geography of Music. Geographical and historical analysis of music as a cultural trait. The cultural significance of music and how it varies from place to place as well as how it helps shape the character of a place.

4323 Computer Cartography. Lab 2. Use of packaged computer programs to produce maps on both the printer and the plotter.

4333* (I)Remote Sensing. Lab 2. Prerequisite: 3523 or FOR 3682 or GEOG 3202 or 5153. Use of several types of sensors and imagery in solving problems. LANDSAT imagery use. Uses and limitations of data extraction techniques, manual and computer-assisted. Applications to a variety of specific problems.

4343 Geographic Information Systems. Lab 1. Prerequisites: 3133 or 4233 or 4333. Evaluation and application of computer-based GIS (Geographic Information Systems). Sources of data, conceptual approaches, equipment, and software. Discussion of various output products, specific applications, and GIS relationships to modeling.

4640 Geographic Regions. 1-9 credits, maximum 9. Prerequisite: permission of instructor. Specialized directed study of specific local and foreign regions.

4713* History and Philosophy of Geography. Historical research questions and techniques, the structure of contemporary geography and its relations to other fields of study, and future prospects for geography.

4910* Topics in Geography. 1-6 credits, maximum 9. Prerequisite: permission of instructor. Specialized physical, social and methodological topics in geography.

4921* Applications of Geographic Analysis. Prerequisites: 3523, 3533. For geography majors or minors only. Applications of concepts and techniques relating to the students’ specializations. Designed to reinforce and synthesize knowledge gained from previous course work.

4930* Readings in Geography. 1-3 credits. maximum 9. Prerequisite: permission of instructor. Directed readings on selected topics, regions or methods in geography.

5000 Thesis. 1-6 credits, maximum 6. Open only to students working on the master’s degree in geography.
5010* Graduate Cooperative Education Internship. 1-3 credits. Maximum 9. Prerequisite: consent of departmental adviser and permission of instructor. Practical experience in applying geographical concepts to societal problems. Emphasis on programs in planning and geographical education.

5012 Advanced Geographical Analysis I. Lab 2. Prerequisite: 3533 and one course in statistics. Library, field techniques, questionnaires and data processing in geographical research contexts.

5023* Advanced Geographical Analysis II. Lab 2. Prerequisite: 5013. Application of models to geographic problem solving.

5033 Geographic Education. For both prospective and experienced teachers of geography. Geography's role in the social and behavioral sciences; analysis of geography curricula, comparison of various instructional approaches (traditional and experimental); and examination of current research in geographic education.

5100 Remote Sensing of the Physical and Cultural Environment. Prerequisite: undergraduate course in remote sensing and one course in statistics. Advanced interpretation and analysis of remotely sensed data on physical and cultural features of the earth's surface.

5303 Geographic Methodology. Prerequisite: 9 credit hours of geography. The nature of geography and its relation to other fields of study. The scientific validity of concepts and questions used in contemporary geographical research. Strategies for development, synthesis, communication and use of the geographic body of knowledge.

5340* Field Techniques in Geography. 1-3 credits, maximum 6. Prerequisite: 6 credit hours of geography or consent of instructor. Collection and analysis of field data. Field projects.

5430 Special Studies in Regional Analysis. 1-6 credits, maximum 6. Prerequisite: 3533. Application of geographical analysis to selected regions.

5450* Seminar in Geography. 1-6 credits, maximum 15. Prerequisite: graduate standing in geography or consent of instructor. Specialized topics in geography.

5510 Research Problems in Geography. 1-3 credits, maximum 9. Prerequisite: permission of instructor

GEOL OGY (GEOL)

1011 (L,N) General Geology Lab. Lab 2. Prerequisite: previous or concurrent registration in 1014. Environmental experiments in the geosciences. Field trips required.

1014 (N) General Geology. Lab 2. The influence of geology and related earth sciences on the human environment. Emphasizes energy and material resources, beneficial and hazardous natural processes, and the planetary and biological evolution of earth. Lab investigations are environmentally oriented. Field trips required.

1112 (L,N) Physical Geology. Lab 2 Composition and structure of the earth and the modification of its surface by internal and external processes. Mineral resources, sources of energy, and environmental aspects of geology. A background in precollege science and math is recommended. Field trips required.

1124 (L,N) Historical Geology. Lab 3. Composition and structure of the earth, chiefly as related to oil and gas. Emphasis on basic stratigraphic and structural-geologic principles applied to oil exploration and production. Field trips required.

2214 (L,N) Historical Geology. Lab 3. Prerequisite: 1114. Earth history: with major emphasis on mountain-building, development of continents and oceans and evolution of animals and plants. Field trips required.

2014 (N) Scenic Geologic Regions. Prerequisite: 1014 or equivalent. Emphasis on the geologic story of national parks and scenic regions in North America and throughout the world.

2031 (L,N) Field Investigation. Prerequisite: introductory geography. One week of required field study at sites of geological interest and significance.

2253 Mineralogy. Lab 3. Prerequisites: 1114 or equivalent, CHEM 1314 or equivalent. Crystallography and systematic study of mineral groups and their genesis. Identification of minerals by physical and chemical properties. Field trips required.


3004 Earth Science for Teachers. Prerequisite: 1114. Teaching natural earth systems and their environmental impact. Use of an adaptation approach in organizing, presenting, and evaluating earth science concepts in the curriculum.

3014 Structural Geology. Lab 3. Prerequisites: 1224, MATH 1613 and PHYSC 1114. Behavior of earth materials during various deforming processes and analysis of the resulting structural features. Field trips required.

3024 Geology for Engineers. Lab 3. Prerequisite: junior standing in engineering. Physical geology with emphasis on applications to civil engineering. Field trips required.

3033 Stratigraphy. Lab 3. Prerequisite: 1224. Principles of stratigraphy and their applications. Laboratory emphasizes realistic practical problems undertaken in the field and in the laboratory. Field trips required. Nonmajors may receive graduate credit.

3073 Geomorphology. Lab 3. Prerequisites: 1224 or consent of instructor. Study of land forms and the processes that form them, using topographic maps, air photos, remotely-sensed images, soils maps and field techniques. Field trips required.

3103 Paleontology and Biostratigraphy. Lab 3. Prerequisites: 1224, BISC 1114 or equivalent. Morphology and systematic study of marine and non-marine fossils. Basic principles of biostratigraphy. Field trips required.

3124 Advanced Geology for Petroleum Technologists. Lab 3. Prerequisite: 1124 or equivalent. Principles and techniques of solving problems in structural and stratigraphic entrapment of oil and gas. Emphasis on interpretation of subsurface data and maps, including well logs and various kinds of maps. Field trips required.

3546 Geology. Lab 6. Prerequisites: 2364, 3014, 3033. Observation of field methods in geology including mapping by plane and compass, plane table and aerial photographs. Required of all geology majors. Transportation and room and board fees required.

4010 Geology Colloquium. 1 credit, maximum 8. Prerequisite: junior standing. Lectures and demonstrations of timely interest in geology. Field trips may be required.

4023 Petroleum Geology. Prerequisites: 3014 and 3033. Origin, migration and accumulation of petroleum, requirements for source rock, reservoir rock and traps. Structure and stratigraphy of selected oil fields. Field trips required.


4453 Hydrogeology I. Water cycle with emphasis on surface water-ground water interaction, water pollution, and water law. Interrelations between the sciences and the humanities.

4463* Hydrogeology II. Lab 3. Prerequisite: 4453. Physical ground-water systems. Realistic problems to acquaint students with ground-water occurrence and movement. Geophysical techniques for engineering geohydrological modeling techniques used to define a ground-water system. Field trips required.

4563* Sedimentology. Lab 3. Prerequisites: 3546, senior standing. Sedimentary processes and sedimentary environments, geometry and internal features of sediments. Field trips required.

4663* Economic Geology. Lab 3. Prerequisite: 2364. Descriptive geology origin, economic utilization of metallic and nonmetallic minerals and rocks. Field trips required.

4990* Special Problems in Earth Science. 1-8 credits. Prerequisites: 25 hours of geology and permission of instructor. Individually designed study projects involving assigned reading, library work, field work, laboratory work or a combination of these. Field trips may be required.

5000 Thesis. 1-6 credits, maximum 6. Prerequisite: approval of graduate committee. Work toward master's thesis in geology.

5100 Problems in Hydrogeology. 1-3 credits, maximum 6. Prerequisite: 4453. Advanced problems in hydrogeology with emphasis on quantitative methods. Field trips may be required.

5150 Problems in Engineering Geophysics. 1-3 credits, maximum 3. Prerequisite: consent of instructor. Advanced problems in engineering geophysics with emphasis on problem solving. Field trips may be required.

5183 Advanced Paleontology. Lab 3. Prerequisite: 3103 or equivalent. In-depth study of selected fossil groups with emphasis on marine microfauna. Students project on assigned fossil groups with presentation of results both orally and in writing. Field trips required.

5203* Advanced Structural Geology. Lab 3. Prerequisite: 3014. The theoretical, experimental and descriptive approach to structural geology; includes correlations between stress field, rock type, and structural style in petroleum exploration.

5223 Advanced Map Interpretation. Lab 3. Prerequisite: 3014. Geometric techniques and analysis of complex structural terrain. Elucidation of geological history by study of selected maps. Field trip required.


5283 Subsurface Geologic Methods. Lab 3. Prerequisites: 3014, 3033. Use of subsurface geologic information from core descriptions, well logs to prepare maps and identify oil and gas prospects. Field trips required.


5333 Advanced Well Log Analysis. Lab 3. Prerequisites: 3014, 3033. The geologic interpretation of a variety of well logs, involving both modern and "old" logs. The art of interpretation emphasized, as well as quantitative methods. Some exercises involve concurrent interpretation of well logs and core samples, or well logs and bit cuttings.
Prerequisite: 1225 or (H,I) First Readings in German. (May have been gained in high school.) Colloquial Lab 1 1/2. Prerequisite: 1115 writing. Skills of listening comprehension, speaking, reading and grammar and pronunciation, with work on the four basic Lab 1 1/2. Main elements of 1115 GERMAN (GRMN) 8. Prerequisite: consent of instructor. Individual library, Advanced Studies in Geology. 5710 evolution. Field trips required. 5603, 5363. Team-taught course. Interpretations of the evolution of selected sedimentary basins. Emphasis on aspects of environmental health. 5553 Environmental Geochemistry. Lab 3. Prerequisite: 3546, 5203, 5223, 5253, 5363. Team-taught course. Interpretations of the evolution of selected sedimentary basins. Emphasis on facets analysis, petrography, diagensis, and structural evolution. Field trips required. 5710 Advanced Studies in Geology. 1-4 credits, maximum 12. Prerequisite: consent of instructor, Individual library, laboratory and/or field projects on facets of geology not covered by existing courses. Field trips may be required.

GERMAN (GRMN)

1115 (I) Elementary German I. Lab 1 1/2. Main elements of grammar and pronunciation, with work on the four basic skills of listening comprehension, speaking, reading and writing. 1225 (I) Elementary German II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1115.

2112 (H,I) Intermediate Conversation and Composition I. Lab 1. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Colloquial speech patterns and grammar. May be taken concurrently with other 2000-level German courses.

2113 (H,I) First Readings in German. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Selections from German newspapers and other contemporary material. May be taken concurrently with other 2000-level German courses.

2222 (H,I) Intermediate Conversation and Composition II. Lab 1. Prerequisite: 2112 or equivalent competence. (May have been gained in high school.) Continuation of 2112, with further work in composition, conversation and grammar. May be taken concurrently with other 2000-level German courses.

2223 (H,I) Introduction to German Literature. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Reading and analysis of prose, drama and poetry; literary appreciation. May be taken concurrently with other 2000-level German courses.

3013 German for Reading Requirements I. Reading in the humanities and the sciences. Translation from German to English.

3023 German for Reading Requirements II. Prerequisite: 3013 or equivalent. Intermediate and advanced reading in the humanities and sciences. Translation from German to English.

3341 (I) Business German. Lab 1. Prerequisite: 20 credit hours of German or equivalent. Introduction to business practices and economic environment in Germany. Study of specialized vocabulary.

3463 (I) Advanced Diction and Phonetics. Lab 1. Prerequisite: 15 credit hours of German or equivalent. Required course for teacher certification. German speech sounds and intonation patterns. Practice to improve the student's pronunciation.

3803 (H,I) Advanced Conversation. Lab 1. Prerequisite: 20 credit hours of German or equivalent. Colloquial speech forms and sentence structure. Practice in brief public address in German.

3913 (H,I) Advanced Grammar and Composition. Lab 1. Prerequisite: 20 credit hours of German or equivalent. Practice in original composition in German. Problematic points of German grammar and style.

4301 (H,I) Orientation to Internship Abroad. Prerequisite: 20 hours of German or equivalent. Preparation for residential internship in a German-speaking country. Culture, civilization, and contemporary conditions, and communication for students accepted for international cooperative education program.

4903 (H,I) Internship Abroad. Lab TBA. Prerequisite: 3902. Practical studies in a German-speaking country. Supervised research papers and reports, and oral testing, during and following the practicum.

4293 (H,I) Survey of German Literature I. Prerequisite: 20 credit hours of German or equivalent. German literature from the beginning to 1785.

4295 (H,I) Survey of German Literature II. Prerequisite: 20 credit hours of German or equivalent. German literature from 1785 to the present.

4513 (H,I) The Age of Goethe. Prerequisite: 20 credit hours of German or equivalent. Principal figures of German Classicism and Romanticism.

4523 (H,I) 19th Century German Theater. Prerequisite: 20 credit hours of German or equivalent. Kleist, Buchner, Goethe, Hebbel, Hauptmann and others.

4533 (H,I) 19th Century German Novelle and Lyric. Prerequisite: 20 credit hours of German or equivalent. Prose and lyric from Romanticism to Naturalism.

4543 (H,I) 20th Century German Literature. Prerequisite: 20 credit hours of German or equivalent. Main currents in German literature from Naturalism until present day.

4550 (I) Studies in German. 1-3 credits, maximum 9. Prerequisite: 20 credit hours of German or equivalent competence. Reading and discussion of vital subjects in German.

GRADUATE (GRAD)

5880* Graduate Traveling Scholar. Credit will vary depending on the program of each traveling scholar. Credit is 12. Prerequisite: graduate standing. Graduate-level instructional program in research and teaching techniques and procedures. Graded on pass-fail basis.

601* Research or Intern Practicum. 1-9 credits, maximum 12. Prerequisite: graduate standing. Graduate-level internship program for public administration, service or research. Blends the theoretical and absolute phase of the academic with practical on-the-job experience.

GREEK (GREEK)

1113 (1) Elementary Classical Greek I. Grammar and vocabulary of Ancient Greek.

1223 (I) Elementary Classical Greek II. Prerequisite: 1113 or equivalent. A continuation of 1113. Grammar and readings of classical Greek authors.

2113 (I) Elementary Classical Greek III. Prerequisite: 1223 or equivalent. A continuation of 1223. Grammar and readings of classical Greek authors.

2213 (H,I) Intermediate Readings. Prerequisite: 2113 or equivalent. An introduction to a variety of classical authors to increase reading facility and grammatical comprehension.

3330 (I) Advanced Readings. 1-6 credits, maximum 9. Prerequisite: 2213 Prose authors, epic poetry, drama, Koine Greek and religious texts.

HEALTH (HLTH)

2213 Foundations in Health Education and Wellness. Analysis of major concepts e.g. degenerative disease, human exercise capacity, health behavior, etc.

2220 Laboratory and Clinical Experiences in Health. 1-3 credits, maximum 3 Prerequisite: 2213 Directed observation and supervised laboratory and clinical experiences in appropriate teacher education and wellness program areas.

2602 First Aid. Lab 2 A competency/performance-based first aid course.

2603 Total Wellness. Knowledge, attitudes and practices related to self-direction of health behavior for total well-being.

2653 Applied Anatomy. Action and location of individual muscles and muscle groups. Anatomy as applied to the living person. Common anatomical injuries and diseases will be presented with each joint structure.

2663 Care and Prevention of Athletic Injuries. Prerequisite: 2653. Symptoms of common athletic injuries, their immediate treatment and care.

3613 Community Health Programs. Structure and function of health agencies and programs in the total community.

*Approved for Graduate Credit
HEALTH, PHYSICAL EDUCATION AND LEISURE (HPELS)

3010 Health, Physical Education and Leisure Sciences Workshop. 1-3 credits, maximum 6. Concentrated study of selected areas of health, physical education and leisure sciences. Problems in instruction and administration not normally available in undergraduate curriculum.

4010 Directed Study. 1-3 credits, maximum 6. Prerequisite: written approval by department head. Supervised readings, research or independent study of trends and issues related to the area of health, physical education or leisure services.

4480 Internship. 4-16 credits, maximum 16. Prerequisite: last semester-senior year status. Supervised field work experiences in health, physical education or leisure services.

5000* Thesis or Report. 1-6 credits, maximum 6.

5003* History and Philosophy of Physical Education. The history and philosophies of physical education beginning with ancient Greece and continuing through modern Europe and America.

5010* Seminar. 1-2 credits, maximum 4. Selected topics from the profession not covered in other courses. Presentation and critique of research proposals and results.

5020 Health, Physical Education and Leisure Workshop. 1-6 credits, maximum 6. Selected areas of health, physical education and leisure.

5023* Legal Aspects of Health, Physical Education and Leisure Sciences. The law; its application and interpretation as it applies to teachers, coaches and administrators of health, physical education and leisure sciences programs.

5030* Field Problems in Health, Physical Education or Leisure Sciences. 1-6 credits, maximum 6. Individual investigations.

5043* Trends and Issues in Health, Physical Education and Leisure Sciences. Major trends and issues in higher education and professional preparation; principles, practices, problems and improvements in HPELS; future needs and program innovations.

5053* Research Design in Health, Physical Education and Leisure. Prerequisites: PSYCH 5303 or STAT 5013 or equivalent. Research design with applicability toward HPEL. Provides the student with a conceptualization of health, physical education and leisure.

5073* Sport: Psychological Aspects. Psychological foundation and sport emphasizing performance enhancement by athletes through psychological training techniques.

5143* Organization and Administration of Recreation. Systematic approach to problem solving and decision making for structure, personnel management, finance and program development for recreation delivery systems.

5423* Camp Administration and Programming. Management of budget, site development, program evaluation and selection and training of personnel.

5433* Development of Leisure Services Delivery Systems. Concepts and principles of administration and management, including planning, organization, supervision and evaluation for a variety of leisure services delivery systems.

5443 Social Foundations of Recreation and Leisure. Social and philosophical foundations of recreation and leisure with emphasis on the contributions of recreation and its effect on man throughout history.

5453 Practicum for Human Service Professionals. A wilderness-based program for educators and human service professionals utilizing Colorado Outward Bound Schools experiential educational model for adapting traditional teaching methodologies.

5513 Organization and Administration of School and Community Health Education. Basic functions and principles of organization and administration pertaining to both school and community agencies.


5533 School Health Curriculum. Knowledge and experience in curriculum development and evaluation.

5543 Health Education in the Community. Health education in the community setting through various nongovernment agencies in conjunction with actual health care facilities.

5563 Cardiac Rehabilitation. Prerequisites: HLTH 2653 and PHSI 3113 or equivalent. Factors involved in cardiovascular disease. History, implementation and administration of cardiac rehabilitation programs.

5733 Motor Learning. Research in psychology and physical education relevant to the understanding of the nature and basis of motor skill learning.

5753* Laboratory Assessment of Human Work Capacity. Prerequisite: PHSI 3113 or equivalent. Instruction and practice in use of modern laboratory facilities, equipment and techniques used in the evaluation of human work capacity.

5763* Administration of Health, Physical Education, Leisure and Sports Programs in Higher Education.

5773 Corrective Physical Education. Prerequisites: HLTH 2653 and 3652. Prevention, detection and correction of remediable physical defects.

5793 Mechanical Analysis of Physical Education Activities. Prerequisites: HLTH 2653, 3663, HPELS 5823 and 5843. Application of physical laws to physical education activities.

5823* Advanced Applied Anatomy. Prerequisite: HLTH 2653. Human skeleton and its relation to physical activities; emphasis on structure and mechanical factors involved.

5843* Quantitative Biomechanics and Kinesiology. Prerequisites: 5823, HLTH 3663. Analytical approach to the study of human motion as applied to kinesiological description and kinematic and kinetic evaluation.

5853* Stress Testing and Exercise Prescription. Lab. 2. Prerequisites: PHSI 3113 or equivalent. Theory and practice in testing and exercise EKG, stress test protocols and exercise prescription.

5873* Human Bioenergetics. Prerequisite: PHSI 3113 or equivalent. Human energy production, utilization and storage in response to exercise.

6010* Independent Study in Physical Education and Leisure Services. 1-6 credit hours. maximum 6.

HISTORY (HIST)

1010 Studies in American History. 1-2 credits, maximum 2. Special study in American History to allow transfer students to fulfill general education requirements as established by Regents’ policy.

1103 Survey of American History. Meaning, vitality, and uniqueness of United States history since 1492 through a thematic examination of our nation's past. Satisfies, with POLS 2013, the State law requirement of 6 credit hours of history and government before graduation. No credit for students with prior credit in HIST 1483 or 1493.

1483 American History to 1865. From European background through Civil War. Satisfies, with POLSC 2013, the State law requirement of 6 credit hours of history and government before graduation. No credit for students with credit in HIST 1103.

1493 American History Since 1865. May be taken independently of HIST 1483. Development of the United States including the growth of industry and its impact on society and foreign affairs. Satisfies, with POLSC 2013, the State law requirement of 6 credit hours of history and government before graduation. No credit for student with credit in HIST 1103.

1613 Western Civilization to 1500. Lab. 1. History of western civilization from ancient world to Reformations. Laboratory discussion sessions on interpretation of primary sources in translation.
History

1623 (H,I,S,SpD)Western Civilization After 1500. Lab 1. History of western civilization from Reformation to present. Laboratory discussion sessions on interpretation of primary sources in translation.

1713 (H,I,S)Survey of Oriental Civilization. The independent yet related histories of India, China, Japan, Korea and Southeast Asia with special attention to the origins and development of oriental civilization from pre-history to the 17th Century and on the contribution of power and violence to the evolution of civilization.

2323 (S)Alabama History. Early exploration and establishment of Indian Territory; the rise and demise of the Five Indian Nations; and the organization and development of the 41st state to the present. Required of all candidates for teacher's licensure/certification in social studies.

3003 (I,S)Soviet Union: History, Society and Culture. A comprehensive view of the Soviet Union, stressing those issues in the political, economic, technological, geographical and cultural spheres which are most relevant to the current situation. Accessible to beginning undergraduate students. Same course as POLSC 3053, and RUSS 3003.

3013 (H)Ancient Near East. The ancient world from the beginnings of recorded history through the Egyptian, Mesopotamian, Hebrew and Persian civilizations, in addition to the minor civilizations of the area.

3023 (H)Ancient Greece. The Greek world from the Bronze Age through Alexander, with special emphasis on politics, culture and institutions of Classical Greece.

3033 (H)Ancient Rome. Political, social, economic and cultural history of the Roman Republic and Empire.

3153 (H)Russia to 1861. Political, institutional, societal and economic development of Russia from the Kievian period to the Great Reforms.

3163 (H,Russia)Since 1861. Modernizations of Russia in the 19th and 20th centuries. Great reforms and their effects and the 1917 revolutions and their consequences.

3173 (H)Eastern Europe, 1000-1800. Formation of the eastern European nations and the influence of Rome, Byzantium, the Ottoman Empire, Russia, Austria and Prussia on them.

3183 (H)Eastern Europe Since 1800. Formation and impact of nationalism, industrialization, and power politics on the peoples of eastern Europe.

3203 (H)Early Middle Ages, 325-1000. Economic, social, cultural and religious developments in Byzantium, Islam, and the Germanic West, which succeeded imperial Rome.

3233 (H)Medieval Europe, 1000-1350. High and Late Middle Ages in the West with emphasis on political, social, economic and intellectual development.

3243 (H)Renaissance and Reformation, 1550-1618. Social, cultural, intellectual, political, economic and religious developments which led to the flowering of modern western civilization.

3253 (H)Early Modern Europe, 1618-1815. Economic, social, political, cultural, intellectual and religious transformation of Europe from the opening of the Thirty Years War to the Congress of Vienna.

3263 (H)Modern Europe, 1815-1914. Impact of modernization on the character of European society. Factors that transformed the Continent into a battle ground in the 20th century.

3273 (H)Modern Europe Since 1914. Origins, character and impact of the first World War; emergence and consequences of the totalitarian state; nature of political and intellectual terrorism. Effects of worldwide economic depression; dilemmas of modern democracies; political collapse of Europe as a consequence of World War II.

3293 History of Christianity. An intellectual and cultural history of Christianity from the second century to the present day. Same course as REL 3293.

3323 (H)History of the Second World War. Problems leading to World War II with their international implications and consideration of the war years.

3353 (H,I)Imperial Spain, 1450-1800. The rise and fall of Spain's first modern imperial power, from Spain's emergence under the "Catholic kings" to its rejuvenation under the Bourbons, with topics on political, artistic, and cultural history.


3393 (I,S)Modern England: 1714-Present. English history from the arrival of the house of Hanover through the decline of British influence following the Second World War. Political, social, and economic problems encountered as a result of the creation of the first modern industrialized state.

3403 (H,I)East Asia to 1800. Traditional Chinese civilization and its impact on Japan, Korea and Southeast Asia.

3413 (H,I,S)East Asia Since 1800. Impact of the Occident on China, Japan and Southeast Asia. Problems of trade and diplomacy; political and industrial transformation of Japan; revolutionary process in China; the rise of nationalism in Southeast Asia.

3423 (H)Modern Japan. Modernization process in Japan since 1868.

3433 (H,I)Modern China. Response of China to the West since 1840, with stress on economic, social and intellectual currents.


3463 (H,S)Modern Latin America. Latin America republics emphasize contributions made by agriculture.


3483 (H)Modern Portugal. The 19th and 20th centuries. Great reforms and their effects and the 1917 revolutions and their consequences.

3493 (H,I)History of the Second World War. Problems leading to World War II with their international implications and consideration of the war years.


3513 (S)American Colonial Period to 1750. Colonization of British and French North America; colonial political, social, cultural, intellectual and economic development; international rivalries; the imperial structure.

3523 (S)Era of the American Revolution. British imperial problems; the American Revolution; political, cultural, economic, social and religious change; the War for Independence; the Articles of Confederation; the critical years.

3533 (S)Early National Period, 1787-1828. Drafting and adopting the Constitution, organizing the government, Jeffersonian Republicanism, the War of 1812, territorial expansion, the new West, nationalism and sectionalism.

3543 (S)The Jacksonian Era, 1828-1850. Development of a modern political system and an entrepreneurial economy; social reform; territorial expansion; and sectionalism.

3633 (S,Civil War and Reconstruction, 1850-1877. Causes, decisive events, personalities and consequences of the disruption and reunion of the United States.

3663 (S,Rubber Barons and Reformers: U.S. History, 1877-1919. The impact of industrialization upon American society and politics. The rise of World War I, the Progressive movement and World War I.

3673 (S)America Since 1919. The United States since the 1920's with emphasis upon the 1920's, the depression, the New Deal, World War II and its aftermath; retreat from imperialism in the 1920's to world leadership in the 1950's.

3743 Trans-Appalachian West. Settlement and development of the frontier of the eastern Mississippi River including the French and Spanish colonies, British occupation, Indian resistance and American conquest through the Jacksonian Era.

3753 Trans-Mississippi West. Emergence of the modern West from Spanish and French settlement and exploration, the Rocky Mountain fur trade, the settlement of Texas, Oregon, California, and Utah, the mining, ranching and farming frontiers, the Indian Wars and transportation.

3763 (S)American Southwest. Southwestern states of Texas, Arizona, New Mexico and California from the Spanish colonial period to the present. Mining, ranching, farming frontiers, Indian wars of the Apache, Comanche and other southwestern tribes, and the emergence of the modern Southwest.

3773 Old South. Social, political and industrial conditions in the South before the Civil War.

3783 (S)New South. Recent history and major current social and economic problems of the southern regions of the United States.

3793 (S)Indians in America. American Indian from Columbus to the present, emphasizing tribal reaction to European and United States cultural contract and government policy.

3913 (H,S)History of Medicine. Historical growth of medical science and its relationship to the society in which it develops. Scientific and medical problems, cultures, religious, and economic problems associated with the historical development of medicine.


3943 (H)Religion in America. Impact of the varieties of American religious experience on national life.

3977 Historical Methods and Interpretations. Required of all history majors. Introduction to historical methods and interpretations.


4063 Historic Preservation. Focuses on the United States and examines the history and theory of the preservation movement, the legal basis for preservation of the built environment, and the methodology of preservation.

4143 American Agricultural History. Growth and development of the agricultural foundation of the United States including the social, technological and economic contributions made by agriculture.


4253 American Foreign Relations to 1917. American experience in foreign relations from colonial times to World War I.
American Social and Intellectual History Since 4483
American Military History.  Emergence as the decisive factor in the world balance
American Foreign Relations Since 1917.
emergence to the present.

(H)Women in Western Civilization.  Life, politics, family, work and modern society.

Indians of Oklahoma. The Ave Civilized Tribes and

ECON 5220 Development of an economic society since the Civil War. Same course as

American Urban History.  Impact of urbanization upon American communities from 1865 to the present. Evolving political and social institutions,

(S)American Economic History.  Economic development and economic forces in American history; emphasis upon industrialization and its impact upon our economic society since the Civil War. Same course as ECON 3823.

American Environmental History.  Development of an environmental context for American history by probing the diverse and changing responses of Americans toward their environment.

(S)Blacks in America.  Achievements of the black man in America and his participation in the development of the United States.

Indians of Oklahoma.  The Ave Civilized Tribes and Plains Indians and their role in the history of Oklahoma to the present.


(H)Women in Western Civilization.  Women in the development of Western Civilization from the earliest times to the present.

(H)History of Culture in India.  Literature and arts of India and Pakistan studied in their historical and philosophical context. Same course as REL 4613.

Topics in History.  1-3 credits, maximum 9. For students interested in pursuing either a research or a reading project.

Research Seminar.  1-3 credits, maximum 3. Prerequisite: consent of instructor. Analysis of research findings related to issues.

Research Seminar.  1-3 credits, maximum 3. Prerequisite: consent of instructor. Analysis of research findings related to issues.

Prerequisite: consent of graduate committee. Supervised research in applied history.

Prerequisite: consent of graduate committee. Supervised practical experience in applied history.

Reading Seminar in American History.  3 credits, maximum 5. Historiographical and bibliographical study of special areas of American history.

Reading Seminar in European and World History.  3 credits, maximum 5. Historiographical and bibliographical study of special areas of European and World history.

Research Seminar in American History.  3 credits, maximum 15. Research in selected problems in American history.
Horticulture (HORT)

1003
Home Horticulture. Lab. 2. Horticulture around the home. Planning and care of home grounds, the fruit and vegetable garden and selection, use and care of indoor plants. Intended for non-majors only.

5103
Teaching Human Development and Family Life. 2-3 credits, maximum 3. Prerequisite: concurrent instructor. Critical study of problems and recent developments in home economics education and community service programs.

5340
Supervision of Student Teaching in Home Economics. 2-3 credits, maximum 3. Prerequisite: concurrent teaching experience. The preparation of home economics teachers with emphasis upon the provision of learning experiences for student teachers.

5413
Management of Family and Community Service Programs. Prerequisites: graduate standing and one year work experience. Planning, personnel development, resource development, management and evaluation for community service.

5423
Promoting Community Service Programs. Strategies for promoting participation and community support for non-profit programs. Applications to the promotional problems of organizations.

4750
Independent Study in Home Economics Education and Community Services. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Various units of work related to specific problems in home economics education.

4820
Program Planning. 2-4 credits, maximum 4. Factors that influence planning and change in educational programs related to community services and home economics. Principles of program development in agencies and institutions with differing purposes and organizational structures.

4983
Conference and Meeting Planning. Prerequisite: junior, senior or graduate standing. Planning and implementing conferences, teleconferences, conventions, meetings, seminars and symposia. Includes designing, promoting, managing and evaluating educational events.

5000*
Masters Thesis or Report. 1-6 credits, maximum 6. Prerequisite: consent of major adviser. Research in home economics for M.S. degree.

5010
Seminar in Family and Community Services. 1-6 credits. Prerequisite: concurrent instruction. Philosophy, trends, and issues affecting leadership, management, implementation, and accountability of family and community service organizations.

503*
Research Methods in Home Economics. Recent problem areas and techniques of home economics research followed by experiences in identifying researchable problems, selection of appropriate procedures for carrying out studies and interpreting findings.

5110
Home Economics Curriculum Development. 2-3 credits, maximum 3. Prerequisite: methods course. A study of major concepts, philosophies and strategies that influence curriculum decisions in home economics programs at all educational levels.

5212
Administration and Supervision of Nonformal Education Programs. Prerequisite: graduate standing. Contemporary theories on administrative skills, management process, managerial styles, and supervisory behavior as they relate to goal orientation, performance, productivity, and professional development.

5223
Contemporary Programs in Home Economics Education and Community Services. Educational philosophies, trends, policies and issues that impact upon home economics and community service programs.

5312
Participative Leadership. Prerequisite: graduate standing. An examination of contemporary theory and practice related to participative leadership, collaborative planning, and sharing responsibility for resource development and program accountability in nonformal educational programs. Practical application of theoretical constructs in group leadership skills, conflict management and team building.

5330
Teaching Consumer Education and Resource Management. 1-3 credits, maximum 3. Prerequisites: ECON 1113, HIDCS 2413 or equivalent or consent of instructor. Objectives, methods, materials and evaluation in teaching consumer education and resource management cooperatively planned and/or taught with HIDCS.

5340*
Supervision of Student Teaching in Home Economics. 2-3 credits, maximum 3. Prerequisite: concurrent teaching experience. The preparation of home economics teachers with emphasis upon the provision of learning experiences for student teachers.

5400*
Apprentice Teaching in Home Economics Education and Community Services Seminar. 1-6 credits, maximum 6. Prerequisite: concurrent responsibility for select graduate students. Critical study of problems and recent developments in home economics education and community services.

4453  Turfgrass Science. Lab 3. Prerequisite: 3153. Investigation of environmental stresses imposed on turfgrass and the interrelationship between stress and the cultural practices of turfgrass.

4670  Horticultural Seminar. 1-2 credits, maximum 2. Required of horticulture seniors, except those choosing landscape options. Topics in horticulture, career exploration and job placement.

4990  Horticultural Problems. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Problems related to pomology, olericulture, nursery production, landscape design, or the culture, sales and arrangement of flowers.

5000  Research and Thesis. 2-6 credits, maximum 6. Research on thesis problems required of master's degree candidates.

5110  Advanced Horticultural Problems. 1-12 credits, maximum 20. Selected research problems in horticulture, olericulture, landscape design; nursery production, olericulture, and pomology.

5123  Horticulture Science. Prerequisites: BOT 3463, BOT 3460 or equivalent or senior standing. The basics of applied physiological responses of plant growth as related to horticulture plants. Includes hormonal, genetic and environmental influences on horticultural plant growth and production.

5290  Experimental Horticulture. Methods of conducting research with horticultural crops including organization and plans, field plot techniques and analysis of data.


5422  Flowering and Fruiting in Horticultural Crops. Prerequisites: BOT 3463. Environmental, chemical and cultural factors affecting the flowering and fruiting of horticultural crops.

5432  Postharvest Physiology. Prerequisites: BOT 3463 and 3450. Physiological causes for postharvest changes in horticultural crops (ripening and senescence) and the basis for certain postharvest treatments (precooling at harvest, controlled atmosphere storage, refrigeration, packaging techniques, etc.) Commodity-specific postharvest phenomena.


2123  Fundamentals of Dining Room Management. Lab 3. Prerequisite: 1113. Experience in organization and management of table and beverage service in varied food service settings. Same course as FNIA 2123.

2223  Executive Housekeeping. Lab 2. Prerequisite: 2111. Housekeeping management in the hospitality industry. Organization, labor controls, material and equipment costs, customer expectations of today's lodging, food service, and institutional housekeeping departments.

2233  Multi-Unit Food Operations. Lab 4. Prerequisites: 3111 and 3123. Experience in operations of multi-unit food services in a variety of work stations.

3103  Institutional Furnishings. Furnishings other than mechanical equipment, furniture, textiles, rugs, linens, etc.

3113  Preprofessional Experience. Prerequisite: sophomore standing or preprofessional experience. The student's future professional role and responsibilities; business procedures; employer, employee and guest relationships in the hospitality industry. Work procedures and job performance evaluations; job applications and resumes.

3133  Science of Food Preparation. Lab 2. Prerequisites: 3113 or FNIA 2113, organic chemistry. Application of scientific principles to food preparation. Same course as FNIA 3133.

3213  Management in Hospitality and Food Service Systems. Prerequisite: a course in economics. Function and methods of management as related to the hospitality and food service industries. Same course as FNIA 3213.

3363  Hotel-Motel Front Office Procedure. Lab 2. Prerequisites: junior standing, 6 credit hours in accounting. Various jobs in the hotel-motel front office and the procedures involved in registering, accounting for, and checking out guests. The organization, duties and administration of institutional housekeeping as related to the front desk.

3440  Hospitality Work Experience. 1-6 credits, maximum 6. Supervised experience in an approved work situation related to a future career in the hospitality industry.

3473  Mechanical Equipment and Building. Illumination, electric wiring, plumbing, heating, ventilation, air conditioning, food preparation and food service equipment utilized in the hospitality industry will be evaluated. Emphasis on maintenance, repair, how it works and what a dirt does. Energy utilization and conservation stressed.

3553  Purchasing in Hospitality and Food Service Systems. Lab 2. Prerequisite: 3133 or concurrent enrollment. Procurement of food and nonfood materials in hospitality and related industries. Same as FNIA 3553.

4103  Legal Aspects of Hotel and Restaurant Management. Research and problems concerning leasing and the legal responsibilities of innkeepers and restauranteurs. Labor relations, collective bargaining and O.S.H.A. restraints considered in relation to operations.

4213  Hotel and Restaurant Promotion and Sales. Prerequisites: junior standing. Fundamentals of sales promotion, the sales department, publicity types, methods of soliciting group business. Versatility, cost, timing and results of use of the advertising media.

4333  Food, Beverage and Labor Cost Controls. Prerequisites: ACCTG 2203, junior standing. Food, beverage and labor cost control systems associated with hospitality industry operations. Same course as FNIA 4333.

4363  Quantity Food Production Management. Lab 4. Prerequisites: HRAD 2123, 3133, 3553. Course in accounting or mathematics. Organization, purchasing, preparation and service of food for large groups. Same course as FNIA 4363.

4413  Hotel Operation Systems Analysis. Conceptual analysis of hotel operation systems such as food and beverage service, housekeeping, sales, properties management, personnel, accounting and front office. Investigation of inter- and intra-departmental functions.

4473  Institutional Food Service Layouts and Equipment. Problems of work experience in Residential Halls Food Service systems. Same course as FNIA 4473.

4483  Hospitality Facilities Layout. Lab 2. Prerequisites: 4473, GENAD 2103. The use of the AutoCad System in the planning process, space allocation and arrangement of furnishings, equipment and utilities in a hospitality facility.

4573  Organization and Management. Prerequisites: 3553, 4683 or FNIA 3553. Organization of personnel and resources in a food service institution and the techniques required by the manager. Lab consists of work experiences in Residential Halls Food Service systems. Same course as FNIA 4573.

4693  Institution Administration. Lab 3. Prerequisite: 4573 or concurrent enrollment. Supervised administrative responsibilities in food services and related institutions such as hotels. Same course as FNIA 4693.

4723  Survey of Beverages in the Hospitality Industry. Prerequisite: senior standing. History, classifications, production techniques and quality factors of beverages such as wines, distilled spirits, beers, and non-alcoholic beverages.

4850  Special Unit Course in Hotel and Restaurant Administration. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special unit of study related to specific problems in the hospitality industry.

4883  Multi-unit Food Service Management. Prerequisites: 4363, MGM 3313. Study of policy and procedure influencing the human side of hospitality management. Management decisions of multi-unit franchising, finance, menu strategy and marketing.

HOUSING, INTERIOR DESIGN AND CONSUMER STUDIES (HIDCS)

1123  Graphic Design for Interiors. Lab 6. Interior design majors only. Drafting and visual communication techniques related to interiors.

2213  Contemporary Issues in Housing, Interior Design and Consumer Studies. Contemporary issues affecting the near environment of the family ecosystem and its relation to quality of life, consumer rights and responsibilities, government policies, housing and design decisions and satisfactions.

2223  Presentation Techniques for Interior Design. Lab 6. Interior design majors only. Two- and three-dimensional presentation techniques using various media and formats.

2313  Introduction to Interior Design. Lab 2. Basic interior design theory including aesthetic, social and economic aspects of the housing environment in relation to needs, values and goals of individuals and families.

2413*  Resource Management for Individual and Family. Principles and procedures of management and their relationships to human and material resources. Emphasis given to the consumer in the marketplace, financial management and time and energy management.

3213  Interior Design Studio I: Residential. Lab 6. Prerequisites: 1123 and 2213. Studio utilizing the design process in the analysis, space planning and construction techniques involved in the design of residential spaces to achieve efficient use of energy and space.

3553  Historical Interiors I. Religious, civic, commercial, and domestic architecture and furnishings to and including the 18th Century with emphasis on the periods which have greatly influenced housing and interior design.
Design of Interior Components, Lab 6. Prerequisites: 1123 and 1313. Design, materials, construction and production of interior design components including custom furnishings and interior treatments and modification.

Environmental Design for Interior Spaces. Prerequisites: 3243. Design factors and human performance criteria for lighting, acoustics and thermal/ atmospheric comfort as they relate to the practice of interior design.

Supervised Field Experience. 1-3 credits, maximum 1123, 2223, 2313. Field experience in specialized residential, commercial and institutional design with both historic and contemporary elements.

Materials and Finishes for Interiors. Prerequisite: 2313. Materials and procedures used in the production of interior design components including custom furnishings and interior treatments and modification.

Design and Space. Lab 6. Prerequisites: 1123, 2223 and 2313. Creative exploration of three-dimensional spaces in interior design.

Socio-economic Aspects of Housing. Family housing needs, present social and economic conditions affecting housing and building processes and the roles of business and government in housing.

Interior Design Studio II: Contract. Lab 6. Prerequisites: 3213, 3243, 3303, 3333 and 3343. Studio course utilizing the design process in the analysis of office planning, including systems and specifications.

Family as Consumers. Prerequisite: junior standing. Economic decision making related to achieving maximum satisfaction from resources spent in the marketplace on housing, food, clothing, transportation, leisure and other dimensions of family-marketplace interaction.

Technology and the Home, Lab 2. Selection, use and application of equipment in the home, including microcomputers and other technologies for management of the home.

Family Finance. Prerequisite: junior standing. Problems faced by consumers in the changing economy; impact of family financial decisions on a consumption-oriented society. Management of family resources including financial planning, credit, insurance, savings, investments, tax and estate planning.

Professional Internship. 1-6 credits, maximum 6. Prerequisite: 3823 and consent of instructor. Participation in a monitored, practical housing, design or consumer-related experience.

Professional Practices for Interior Design. Prerequisites: 2343, 3213 and 3303. Future professional role and responsibilities, business procedures and employer-employee relationships which characterize the employment situation in interior design.

Housing for Special Groups. Problems and alternative solutions for housing for special groups, e.g., the aging, children, the handicapped, low-income, women heads of families and inner city populations. Includes field study or design problem.

Housing in Other Cultures. Housing and interior design and expressions of cultural beliefs, attitudes, family patterns and environmental influences.

Interior Design Studio III: Commercial Residential. Lab 6. Prerequisites 3253, 3363 and 3823. Studio course developing design process in the analysis and planning of commercial, institutional and retail environments with emphasis on materials, codes and accessibility.

Interior Design Studio IV, Lab 6. Prerequisite: 4263. Studio course developing comprehensive interior design projects in the areas of historical restoration/Preservation/adaptive reuse and custom residential planning.

(H)Heritage of Interiors II. Prerequisite: 3233 or consent of instructor. Exploration of the architecture, interiors and furnishings of a variety of structures. Residential, commercial, governmental, institutional, and recreational buildings of different cultures of the 19th and 20th Centuries.

Work Environments and Human Performance. Planning kitchen and work areas for convenience, comfort and contribution to family living. Analysis of home lighting and its utilities for work areas, application of time, motion and work simplification in planning work areas.

Family Resource Management. 3 credits. Exploration of the time, human, environmental and financial resources of the family. Practical application of management principles to the use of family resources through supervised experiences with attention to the development of professional competence as well as personal skills.

Home Equipment Principles and Application. Lab 2. Prerequisite: 3423. Application of physical science principles in a study of selected major and small equipment used in the home. Each individual will complete a project.

Women in the Economy. 3 credits. Economic roles of women in society as consumers and producers in the marketplace and in the home. Exploration of issues raised by the changing economic status of women.

Economics of Aging. Principles of economic and demographic variables affecting income, family living patterns and maintenance of a standard of living.

Analysis of Current Literature Including Research in Housing, Design and Consumer Resources. 1-2 credits, maximum 2. Prerequisite: consent of instructor. An in-depth examination of sources of information and research efforts that relate to housing, design and consumer resources.

Professional Internship. 1-6 credits, maximum 6. Prerequisite: 3823 and consent of instructor. Supervised work experience with attention to the development of professional skills and duties of a practicing professional.

Special Unit Course in Housing, Interior Design and Consumer Studies. 1-6 credits, maximum 6. In-depth study of specific areas of housing, design and consumer resources.

Masters Thesis. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Master's thesis research relating to problems and thesis.

Research Development in HIDCS. Prerequisites: graduate standing and concurrent enrollment in HEC 5100. Current developments and needs in research in HIDCS including application of research methods to HIDCS and research planning.

Contemporary Interior Design Philosophies. Prerequisite: consent of instructor. Interior design philosophies of contemporary designers and trends in interiors.

Studio Design Practicum. 1-3 credits, maximum 6. Prerequisite: consent of instructor. An in-depth study of theoretical design models and philosophies to professional practice.

Historic Interior Design. 1-4 credits, maximum 4. Prerequisite: consent of instructor. In-depth study of the elements of architectural and furnishings historical preservation.

Professional Practices and Evaluation. Prerequisite: consent of instructor. Analysis and evaluation of design business practices and procedures affecting client relations, marketing, legal framework, capitalization and other business functions.

Family and Consumer Policy Issues. Prerequisite: senior or graduate standing. Identification and assessment of the impacts of federal and state legislation on families and consumers. Effects of policies in areas of income maintenance, housing, health, education, social services, employment and contract law.

Housing Environment in Relation to Human Behavior. Prerequisite: consent of instructor. Critical evaluation of selected research dealing with the effects of the housing environment on social, psychological and economic aspects of human behavior.

Housing and Energy. Prerequisite: consent of instructor. The application of changing energy supply and cost on housing, Energy and housing policies, alternative energy sources and future implications.

Human Ecology of the Family. Prerequisite: 4420 or consent of instructor. The family as environment and within environment. Relation of values, goals, standards and decision-making in the management of family resources. The unique role of the family in the social and economic system.

Family Economics. Prerequisite: senior or graduate standing. Individuals and families interact in the labor market in the context of marriage, family roles and family living patterns. The family as a unit dealing with both market and non-market conditions, e.g., wage earning, household production and leisure. Economic well-being of individuals and families regarding economic activities, personal capital, economic interests, two-earner families, one-person-headed households, and distribution of wealth.

Family Financial Security. Prerequisite: 3433 or consent of instructor. Socioeconomic changes, public policies and programs and management practices related to family financial well-being.

Contemporary Consumerism: Issues and Action. Prerequisite: consent of instructor. Consumerism and the consumer movement in today's society. Objective analysis of current and emerging consumer issues, claims of advocates and opposition and involvement and/or action by consumers, business and government.

Graduate Seminar in Interdisciplinary Consumer Education. Prerequisite: consent of instructor. For teachers and professionals who have or expect to have responsibility in consumer education in both formal (school or college) or informal (extension, community, government, business, settings). An intensive study of the purposes, content, materials, methods and evaluation techniques necessary for effective education consumer education programs.

Consumer Economics. Prerequisite: graduate or senior standing. Application of economic theory and principles toward solution of problems of the individual and family unit using price theory concepts. Means by which scarce resources satisfy competing ends and allocation of limited resources for household purchases with budget restraints.

Consumer and the Market. Prerequisite: consent of instructor. Social, economic and political implications of traditional, current and emerging marketplace practices from an analysis of consumer behavior. Moral, ethical and social responsibility of the consumer in the marketplace and the profit motive in each segment of the market place.

Problems in Housing, Interior Design and Consumer Studies. 1-6 credits, maximum 6. Prerequisites, graduate standing and consent of instructor. Individual or group study of a definite aspect of one of the subject matter areas in the Department.

Housing, Interior Design and Consumer Studies Seminar. 1-6 credits, maximum 6. Prerequisite: consent of instructor. A selected group of current issues in housing, design and consumer resources.

Doctoral Thesis. 1-12 credits, maximum 30. Prerequisite: consent of major professor. Research in home economics for the Ph.D. degree under supervision of a graduate faculty member.
5103 Advanced Industrial Quality Control. Prerequisites: 4103, STAT 4033, STAT 4503 or equivalent. Modern quality philosophy and application. Theory and application of traditional and nontraditional control charting techniques. Special emphasis on significant applications such as normality, error-free inspection, etc. Oriented toward economically-based statistical monitoring of processes, including optimization of decision variables such as sample size, frequency, and control limit spread.

5133 Stochastic Processes. Prerequisites: MATH 2613 and STAT 4113. Definition of stochastic processes, probability structure, mean and covariance function, the set of sample functions, Renewal processes, counting processes, Markov chains, birth and death processes, stationary processes and their spectral analyses. Same course as STAT 5133 and MATH 5133.

5203 Advanced Facility Location and Layout and Material Handling Systems. Prerequisites: 4303, 4014, 4203. A continuation and expansion of topics covered in 4203 with an emphasis upon model development for predicting and evaluating the effectiveness of production and/or service systems. Advanced analytical and computer techniques.

5303 Computer Integrated Manufacturing. Prerequisite: 4200. Computer-aided design (CAD) and computer-aided manufacturing (CAM). Design, development, implementation and operation of modern manufacturing systems. Prototype systems design, implementation and testing as well as applicable systems engineering concepts.

5313 Robotics Application Issues. Lab 3. Prerequisite: graduate standing in engineering. Role of robotics in modern manufacturing systems. Design and selection of appropriate end effectors and sensors to produce an effective robot application. Comparison of commercial and custom designs of end effectors and a study of industrial applications. Field trips to industry and work in the IE&M/CAM-Robotics laboratory.

5350 Industrial Engineering Problems. 1-6 credits, maximum 6. Prerequisite: approval of major adviser. A descriptive investigation of a current problem in industrial engineering with a required written report.

5403 Labor Union and Management Processes. Prerequisite: 4413. Contemporary labor/management issues as concerns engineers/managers in organizations. A brief review of labor/management relations; basic theories, relationships, objectives, practices and strategies of both labor and management in modern organizations.


5433 Professional Activity Analysis and Incentive Determination. Prerequisite: 4413. Professional and motivational activities; evaluations of job contents and salary determination. Basic compensation theories and motivation factors including merit/performance rating.


5502 Project Management. Prerequisites: STAT 4033 and FORTRAN. Critical path methodology under conditions of certainty (CPM) and uncertainty (PERT). Network cost accounting and scheduling with limited resources. Modification of network diagrams for key project models. Extensive use of PERT simulation and PMS IV project management computer programs.

5613 Advanced Production Control. Prerequisites: 4014, 4613. Manufacturing planning and control philosophies and methods for production. Materials requirements planning, including information integrity, capacity planning, shop floor control, purchasing, master scheduling, production planning, and demand management. Also just-in-time as used in both Japan and U.S., including total quality control, total cost reduction, and total productive maintenance.


5633 Inventory Theory. Prerequisites: 4014, 4613. Development and use of inventory models for known and/or stochastic demand. Periodic and continuous review inventory replenishment policies. Determination of an appropriate lot size. Consideration of quantity discounts, price change anticipation and various inventory carrying costs. Comparison of inventory policies.

5643 Network Modeling and Analysis. Prerequisites: 4014, 4003. Network approach to the modeling and analysis of complex systems. Deterministic and stochastic network topics include PERT, CPM, decision trees, network flows, flowgraphs, and GERT (Graphical Evaluation and Review Technique). Modeling of practical systems. Systems analysis using computer networks and available computer programs.

5703 Discrete Systems Simulation. Prerequisites: STAT 4033 and FORTRAN. Discrete-event systems via computer. Discrete-event systems building tools for the design and analysis of simulation experiments for complex systems. Application to a variety of problem areas. Use of SLAM simulation language.


5803 Human Factors Engineering. Prerequisites: 3813, STAT 4033 or STAT 4053. Basic consideration of the human beings role in engineering systems, the interface of man-machine systems. Development of human abilities and limitations in relation to equipment designs and work environments.


5903 Systems Engineering and Management. Prerequisite: graduate standing. Systems engineering methodology, tools and techniques. The system function, system development cycle, systems analysis and design. Also the system design process and design for feasibility. Case studies to emphasize the systems approach.

5913 Decision-Making Models for Multi-Objective Analysis. Prerequisite: 4014. Quantitative and qualitative aspects of multiple-criteria decision-making. Dynamics of the decision process are examined and the multi-objective nature of most managerial decision problems is illustrated. Various techniques are studied for the solution of the problems; sequential search procedures, gradient programming, the out-of-kilter algorithm.

5923 Advanced Energy and Water Management. Prerequisite: 4923. Continuation of material covered in 4923 with additional emphasis on environmental issues. Cogeneration, energy management control systems, private purchases of gas, energy accounting. Significant case study or term paper required.

5933 Artificial Intelligence and Expert Systems. Fundamental concepts: search-oriented problem solving, knowledge representation, logical inference, building an expert system, languages and software tools and machine architectures. Applications to planning, computer vision, natural language processing, speech recognition and robotics. Development of a prototype expert system or literature search and report is required. Common lectures with ECEN 5293 and MAE 5793.

5943 Hazardous Material and Waste. Prerequisites: 3503 or equivalent, CHEM 1515. Management of hazardous materials and waste by the generator to reduce operating and environmental costs. Emphasis on hazardous communication program, reducing volume and toxicity, and management activities.

6000 Research and Thesis. 1-15 credits, maximum 30. Preparation of a project or major adviser and/or advisory committee. Independent research for Ph.D. dissertation requirement under direction of a member of the graduate faculty.

6023 Nonlinear Programming. Prerequisites: 5013; FORTRAN. Theoretical and practical aspects of nonlinear optimization. Development and application of optimization techniques used for unconstrained and constrained problems; sequential search procedures, gradient methods. Newton methods and conjugate directions. Lagrange methods, quadratic programming, geometric programming, penalty and barrier methods and projection methods. Same course as COMSC 6023.

6043 Integer Programming. Prerequisites: 4014 or 5013; 5023. Computer-aided design (CAD) and computer-aided manufacturing (CAM). Design, development, implementation and operation of modern manufacturing systems. Prototype systems design, implementation and testing as well as applicable systems engineering concepts.

6050 Computer Aided Design. Prerequisite: 4014. Continuation of material covered in 4923 with advanced emphasis on environmental issues. Cogeneration, energy management control systems, private purchases of gas, energy accounting. Significant case study or term paper required.

6060 Reliability and Maintainability. Prerequisites: 5003, STAT 4033, FORTRAN. Probabilistic failure models of components and systems. Detailed study of reliability measures, and static and dynamic reliability models. Classical and Bayesian reliability testing for point and interval estimation of exponential and Weibull failures. Realizability optimization through allocation and redundancy. Fundamentals of maintainability.

6123 Analysis and Design of Queuing Systems. Prerequisites: 3813, STAT 4013 or STAT 4053, 4003, 4923, 4503, 5703. Modeling, analysis and design of Poisson and nonPoisson queuing systems, including infinite and finite population models, bulk arrivals and networks of queues. Development of methods for analyzing, including computer simulation and aspiration level models. Transient analysis and special topics. Brief review of probability and transform methods.

6423 Theory of Systems Organization II. Prerequisite 5413 or consent of instructor. Theory and practice of internal and external engineering consulting. Investigation of the engineering-client interface, effective engineering consultation, and organizational problems. Emphasis on case studies and organizational cultures and practices, and the engineering practitioners impact on organizational improvement.

6513 Analysis of Decision Processes. Prerequisites: 5003, STAT 4113 or 4203, FORTRAN. Bayesian decision theory with application to optimal decision making in industrial engineering systems. Development of operations research and management science techniques. Formulation of optimization models. Deterministic and stochastic systems. Formulation of decision problems; sequential search procedures, gradient programming, and compromise programming. Attributing importance, risk measurement, and utility measurement.
INDUSTRIAL TECHNOLOGY EDUCATION (ITED)


3002 Introduction to Industrial Technology Education. Industrial technology education in a modern educational system, including the history and philosophic bases for such programs. Purposes, objectives and functions of contemporary industrial arts and technology education programs in public schools. Participation in on-site observation experience in the public schools.

3012 Industrial Tools and Equipment. Lab 3. Proper selection, use and care of shop and laboratory tools and equipment. Emphasis on the nature of the electronic communication industry. Special attention is given to the safety and care of industrial arts and technology education programs.

3022 Theory and Practice in Home Maintenance. Lab 2. Principles of home maintenance and practice in the use of tools, equipment and materials necessary to maintain proper functioning of heating, cooling, plumbing and electrical systems.


3032* Industrial Arts and Technology Education for Elementary and Special Education Teachers. Lab 2. Educational projects and activities for stimulating student interest, developing and broadening student abilities, and generally enhancing the school program. Practical emphasis on reinforcing and strengthening organized industrial arts and technology education activities in elementary and special education curricula. Instruction in the planning, purchase, use and storage of basic tools and appropriate supplies.

3033 Materials and Processes. Lab 4. Introduces students to the basic properties of metallic, polymeric, wood, ceramic and composite materials and the proper techniques used to convert these materials into products. Special attention is given to the safety and care of industrial equipment.

3043 Constructing Structures. Lab 3. Prerequisite: 3033 or equivalent or consent of instructor. Comprehensive study of structural design and its application to planning and constructing residential, commercial, industrial, and civil structures.

3103 Architectural Drawing. Lab 3. Prerequisites: GENT 1153 and MECDT 1223 or equivalent or consent of instructor. Architectural drafting skills and presents information based on current drafting standards and trends in the architectural industry. Preparation of a complete set of drawings in residential and/or light commercial drafting. Computer graphics as a drafting tool.

3223 Electronic Communication Fundamentals. Lab 3. Prerequisite: 3223. A general introduction to contemporary electronic communication technology including telecommunications, hard wired, computer, light, and acoustic systems. An overview of the products and impacts of electronic communication systems and the role of the Institute of the electronic communication industry.

3301* Metrics Measurement for Occupational and Adult Education. Practical applications of the International System of Units as it relates to industry and technology. Prefixes, exponents and symbols, weights and mass, length, volume, and temperature with practical exercises in calculations, conversions, and the use of terminology.

3312 Manufacturing Materials and Testing. Lab 3. Physical properties and testing of materials used in industry such as metals, woods, plastics, ceramics, cements, adhesives and fasteners; stresses the use of such materials in industrial arts and technology education programs.

3323 Manufacturing Processes. Lab 4. Prerequisite: 3033 or permission of instructor. Methods and procedures for processing and materials used in product manufacturing and development. Laboratory practical experiences in processing materials with implications for industrial arts and technology education programs in public schools.

3335* Industrial Communication Graphics. Lab 4. Methods and techniques for the visual communication of ideas and images. The elements of drafting, design, screen production and photography into a total concept of modern graphic communication.

3423 Methods for Teaching Technology Education Systems. Lab 3. Prerequisite: 3033 or consent of instructor. Unique methods and approaches are specifically adapted for and related to the systems of technology education. Fundamental and specific methods for preparation for those students planning to teach technology education in the public schools.

3553* Manufacturing Enterprise. Lab 3. Prerequisite: 3033. The researched activities used in design, engineering, production, and market manufactured products. Additional emphasis on providing financial and personnel support for industrial activities.

3653 Fundamentals of Power Technology. Lab 3. The inputs, processes, and outputs associated with energy systems. Emphasis on the sources of energy; methods of controlling, converting, and transmitting energy; and the utilization of energy conversion systems. Practical experience in overhaul and tune-up of small two and four-cycle engines.

3672 Fundamentals of Power Transmission. Lab 2. Basic mechanics of power transmissions including mechanical, hydraulic, pneumatic and electrical systems. Design and selection of power sources, piping, filtration, accumulators and actuators for programs of industrial arts and technology education.

4013* Research and Development in Industrial Technology Education. Lab 3. Prerequisites: 3033 and 3553. The methodology and practices of technical research and development as conducted in an industrial and educational setting. Laboratory activities performing basic tasks associated with product and process research and development.


4322* Industrial Technology. Industrial materials and manufacturing and processing techniques including assembly, welding, finishing, and evaluation of products. Field trips and lectures. Employer-employee relations are studied as the human element in the system.

4343 Curriculum Development in Industrial Technology Education. Prerequisite: admission to Teacher Education. Principles, practices and problems in construction of industrial arts and technology education curricula.

4440* Industrial Crafts. 1-2 credits. Development of knowledge and skills in working with materials, tools and equipment used in various industrial crafts. Special emphasis placed on specific crafts that are most applicable to the elementary and special education curriculum.

5020* Seminar in Industrial Technology Education. 1-3 credits. Maximum 3. Oral and written discussion of selected current interest topics concerning industrial arts and technology education. Forum for review of research proposals, student programs, other projects and timely topics having an impact on the industrial arts and technology education profession.

5132 Advanced Methods of Teaching Technology Education Systems. Prerequisite: 3423 or equivalent or consent of instructor. Advanced methods, techniques, and activities associated with the teaching of technology education systems. Specific emphasis on the incorporation of problem-solving concepts and activities into public school technology education programs.


5340* Special Problems in Technical Content in Industrial Arts and Technology Education. 1-3 credits, maximum 6. Lab 3. Prerequisites: 3033 and 3333 or equivalent or consent of instructor. Problems associated with the technical content areas in industrial arts and technology education. Introduction of new advanced technical systems into the curriculum of public school technology education programs.

5443 Special Problems in the General Shop. Problems concerning the organization and management of classes and personnel organizations, as well as special teaching methods and class control.

5582 Critical Problems and Issues in Industrial Arts and Technology Education. Analysis of current trends, issues, directions, and research in industrial arts and technology education. Applications to current classroom and program practices.

5663* Special Problems in Industrial Drafting. Special problems, techniques and methods applicable to teaching of mechanical drafting in industrial arts courses. Selection and use of equipment, preparation of course materials and practice in the application of advanced techniques.

INTERDISCIPLINARY STUDIES (IDS)

2023 Studies in the Humanities. The human search for identity and meaning in life: students guided toward broader understandings of themselves and the world through a new appreciation of the humanities and humanistic values. Content of course varies from semester to semester.

2303 (H)Studies in Black American Culture. The cultural role of the black American: history and achievements, as revealed in a study of the black contribution in the fields of literature, music and the visual arts.


3733 (H,SpD)Religion: Psychological Interpretations. Recommended REL 1103 or PSYCH 2313. A study of the development theory and research of modern psychological perspectives on the religious experience. Same course as PSYCH 3733 and REL 3733.

4050 Studies in the Humanities. 1-6 credits, maximum 6. Seminars on selected problems in the fields of humanistic study.

JAPANESE (JAPAN)


2115 (H)Intermediate Japanese I. Prerequisite: 1115 or equivalent. Reading, the writing system, culture, grammar, conversation.


2223 (H)Intermediate Japanese III. Prerequisite: 2123 or equivalent proficiency. A continuation of 2123.
LANDSCAPE ARCHITECTURE (LA)

2002 Landscape Architectural Delineation. Lab 6. Prerequisite: 3 hours credit in freehand drawing or drafting. Drafting and illustration techniques for developing and presenting landscape concepts and designs in black and white media.

2002 Advanced Landscape Architectural Delineation. Lab 4. Prerequisite: 2002. The application of multimedia presentation and delineation techniques to more complex plans, drawings and programs.

3010 Internship in Landscape Architecture and Landscape Contracting. 1-6 credits, maximum 6. Prerequisites: 45 credit hours, consent of internship chairman. Supervised work experience with approved public and private employers in landscape architecture, landscape contracting or related fields. May not be substituted for other required courses.

3673 (I) History and Theory of Landscape Architecture. History and historic styles and approaches to landscape architectural design. Past and present landscape design theory.


3884 Landscape Architectural Construction I. Lab 4. Prerequisite: GIVEN 2613. Site grading, equipment, earthwork calculations, runoff and drainage as they relate to landscape architecture.

3893 Landscape Architectural Construction II. Lab 6. Prerequisite: 3883. Advanced grading, roadway design including horizontal and vertical alignment, site layout and staking plans, advanced stormwater management systems.

4013 Landscape Architectural Design II. Lab 2. Prerequisite: 3773. A continuation of LA Design I with an emphasis on design methodologies.

4023 Landscape Architectural Design III. Lab 9. Prerequisites: 4013 and admission to landscape architecture program. Complex site developments with an emphasis on landforms and structures.

4033 Landscape Planting: Design. Lab 2. Prerequisites: 3773 and HORT 3312 and 3322. Plants in the landscape as aesthetic and functional elements. Environmental enhancement by and for plants. Preparation of planting sketches, plans, and specifications.

4134 Landscape Architectural Design IV. Lab 9. Prerequisite: 4023. Large-scale sites with an emphasis on arrangement and design of landscape elements as they relate to health, safety and welfare as well as functional and aesthetic qualities.

4434 Landscape Analysis and Use. Lab 4. Prerequisites: 4024 and admission to landscape architecture program. The inventories and appraisal of natural and man-made landscape resources and their application to land use.

4573 Recreation Planning. Lab 6. Prerequisite: consent of instructor. Theory and methods for small and large scale area planning with emphasis on natural resource systems.

4681 Landscape Architecture Assembly. Presentations by faculty members and guest speakers dealing with various aspects of landscape architecture or related fields. Graded on pass-fail basis.


4990 LA Special Problems. 1-6 credits, maximum 6. Prerequisite: consent of appropriate faculty member. Landscape architectural related problems.

5024 Landscape Architectural Design V. Lab 8. Prerequisites: 4024, 4893. Large-scale sites with an emphasis on arrangement and design of landscape elements as they relate to health, safety and welfare as well as functional and aesthetic qualities.

5025 Advanced Landscape Architectural Projects. Lab 12. Prerequisite: 5024. Investigation of a landscape architectural problem of major significance, preferably involving an interdisciplinary approach with students and/or faculty members from related fields of study.

5110* Advanced Special Problems. 1-12 credits, maximum 20. Prerequisite: consent of appropriate faculty member. Specific landscape architectural problems.

LATIN (LATIN)

1113 (i)Elementary Latin I. The rudiments of beginning Latin: grammar, vocabulary and elementary readings.

1223 (c)Elementary Latin II. Prerequisite: 1113 or equivalent proficiency. Continuation of 1113. Grammar, vocabulary and readings.

2115 Elementary Latin III. Prerequisite: 1223 or equivalent. A continuation of 1223. Grammar and readings of Latin authors.

2213 (H)Intermediate Readings. Prerequisite: 2113 or equivalent proficiency. Prose selections in Latin from a variety of authors.

3330 (i)Advanced Readings in Latin. 1-6 credits, maximum 9. Prerequisite: 2213. Prose authors, poetry, medieval Latin, etc.

LEISURE (LEIS)

1212 Beginning Swimming. Lab 2. Theory and practice of swimming strokes; techniques and basic water safety skills.

1222 Beginning Fencing. Lab 2. Theory and practice of foil fencing; fundamentals of footwork, defense, and attack, tactics and strategy; boutting; officiating and etiquette.

1232 Beginning Golf. Lab 2. Theory and practice of basic skills, rules, terminology and etiquette.

1242 Beginning Tennis and Racketball. Lab 2. Theory and practice of tennis and racketball; basic skills, rules, terminology, and game strategy for singles and doubles play. No credit for students with credit in 1252.

1252 Beginning Tennis. Lab 2. Theory and practice of basic skills, rules, terminology and game strategy for singles and doubles play. No credit for students with credit in 1242.


1272 Beginning Wrestling. Lab 2. Theory and practice of basic skills, strategies, training methods, equipment, rules and procedures of wrestling.

1292 Beginning Horseback Riding. Lab 2. Theory and practice of progressive skills for English and Western riding.

1312 Archery and Riflery. Lab 2. Theory and practice of archery and riflery; basic skills of target shooting, scoring, care and selection of equipment, and safety rules.

1322 Bowling. Lab 2. Theory and practice of approaches, deliveries, releases and mechanical principles involved in aiming and follow through.

1332 Body Mechanics. Lab 2. Theory and practice of physical fitness, posture, body mechanics in daily activities; fitness improvement, weight control and nutrition, care of the back and feet and relaxation.

1342 Physical Fitness. Lab 2. Theory and practice of aerobic and weight training activities with learning experiences designed to promote physical fitness.

1352 Weight Training. Lab 2. Improvement of muscular strength and endurance in the major muscle groups of the body through progressive resistive exercise. Fundamental anatomy, physiology, mechanical principles, methods and techniques as applied to weight training programs.

1362 Self Defense. Lab 2. Theory and practice of self defense; scientific principles of gravity and body control over opposing forces, and principles of contest judo.

2112 Rock Climbing. Lab 2. Theory and practice in the basics of technical rock climbing, bouldering and spelunking.

2122 Backpacking and Hiking. Lab 2. Theory and practice of outdoor skills and leadership techniques for executing and evaluating a wilderness activity.

2132 Bicycling. Lab 2. Theory and practice in the basics of bicycling, bike touring and bike mechanics.

2142 Canoeing and Kayaking. Lab 2. Prerequisite: 2372 or equivalent. Theory and practice of basic skills and techniques of canoeing and kayaking in open water and whitewater.

2152 Orienteering. Lab 2. Theory and practice in the sport of orienteering skills with emphasis on problem-solving techniques through the use of topographic maps and compass.


2222 Intermediate Tennis. Lab 2. Prerequisite: 1252 or equivalent. Theory and practice of advanced serves and strokes; strategy for singles and doubles play; rules and competitive tennis.

2242 Scuba and Skin Diving. Lab 2. Prerequisite: advanced swimming skills. Theory and practice of skills and techniques, selection of equipment, safety procedures and physics of SCUBA and skin diving.

2252 Dice Production. Lab 2. Prerequisite: 2312. Advanced technique, composition and staging.

2262 Intermediate Reboud Gymnastics. Lab 2. Prerequisite: 1262 or equivalent. Theory and practice of intermediate skills in tumbling, trampoline and mini-tramp; spotting techniques and safety skills.


2282 Beginning Jazz Dance. Lab 2. Theory and practice of fundamental skills and techniques for the contemporary form of jazz dance.

2292 Beginning Tap Dance. Lab 2. Theory and practice of fundamental skills and techniques for tap dance.
**Leisure**

2312 Modern Dance. Lab 2. Theory and practice of basic skills and knowledge relating to the creative and technical aspects of modern dance.

2322 Recreational Dance. Lab 2. Theory and practice of traditional social dances and a variety of "free style" dance forms.

2332 Folk, Square and Social Dance. Lab 2. Theory and practice of folk, square and social dance; basic steps, terminology and etiquette.

2352 Apparatus Gymnastics. Lab 2. Prerequisite: 1262. Theory and practice of apparatus gymnastic skills; balance beam, uneven parallel bars, rings, pommel horse, parallel bars and horizontal bars.

2362 Intermediate Fencing. Lab 2. Prerequisite: 1222 or equivalent. Theory and practice of advanced skills and strategy; techniques of electrical foil fencing; officiating.

2372 Intermediate Swimming. Lab 2. Prerequisite: 1212 or ability to swim 50 yards using strokes. Theory and practice of strokes, diving techniques and water safety skills for the intermediate swimming level.

2382 Orienteering, Rappelling and Hunter Safety. Lab 2. Theory and practice of the sport of orienteering, interpretation of topographic maps and use of the compass; use and care of ropes; basic and advanced rappelling; outdoor living equipment selection; hunter safety.

2392 Basic Roller Skating. Lab 2. Theory and practice of fundamental skills and techniques of roller skating as applied to dance or figure skating.

2413 Introduction to Recreation and Leisure. The nature, scope and significance of leisure and recreation. Delivery systems for leisure services, major program areas and the interrelationship of special agencies and institutions which serve the recreation needs of society.

2422 Outdoor Recreation. Lab 2. Methods and materials for planning, organizing and conducting social activities for groups of various sizes and ages in a variety of social situations.

2433 Introduction to Therapeutic Recreation. Theory and application of therapeutic recreation with emphasis on types of illnesses and disabilities, delivery systems, programming and services.

2512 Advanced Swimming and Life Saving. Lab 2. Prerequisite: 2372 or equivalent. Theory and practice of advanced swimming, lifesaving and water safety skills.

3430 Program Design in Leisure Services. Emphasis on organization, supervision, promotion and evaluation of programs.

3443 Camp Leadership. Lab 2. Philosophy of camping with emphasis on leadership training for organized camp set-up. Principles and concepts of program planning, development of camping and outdoor skills.

3453 Theory of Recreation Leadership. Principles and practical applications of group leadership techniques; problem solving; supervision and evaluation of personnel.

3464 Program Design in Leisure Services. Emphasis on organization, supervision, promotion, and evaluation of programs.

3473 Evaluation of Leisure Services. Emphasis on principles and techniques of evaluation; a practical and systematic approach to the evaluation of leisure activities.

3483 Principles and Clinical Practices in Therapeutic Recreation. Prerequisite: 2453. Clinical intervention techniques and strategies, including treatment techniques, leisure education and role of recreation in the treatment process.

3491 Internship Seminar. Prerequisite: completion of 15 hours in LIBS. Preparation for internship in the field of leisure and recreation.

4213 Methods of Teaching Swimming. Lab 2. Prerequisite: 2512 or equivalent. American Red Cross Water Safety Instructor's Certification.


4453 Outdoor Education. Development of a holistic approach to teaching and learning in the outdoors. Learning in, about, and for the out of doors as a process for acquiring skills with which to enjoy outdoor pursuits.

4470 Areas and Facilities in Recreation. Prerequisites: 3463; PE 3773 or 4712. Planning, design and development of areas and facilities in recreation and physical education.

4473 Outdoor Recreation. Theory and practical application of outdoor recreation concepts with emphasis on philosophies, principles, policies, economics, trends and problems.

4483 Interpretive Services in Recreation. Prerequisite: 4473 or FOR 4553 or concurrent enrollment. Organizational and administrative techniques of interpretive naturalist programs, philosophic approaches, and methods for interpreting the natural and cultural history of public parks and recreation areas.

4493 Administration of Leisure Services. Decision making, problem solving, personnel policies, legal issues, fiscal policies and budget procedures related to the delivery of leisure services.

4513 Facilitation Techniques in Leisure Counseling. Prerequisite: 3483. Philosophy, history, trends, models, legal aspects and basic methods of leisure counseling and leisure education.

4523 Program Design in Therapeutic Recreation. Prerequisite: 3483. Systematic approach to the development, design and evaluation of therapeutic recreation programs.

4563 Industrial and Commercial Recreation Management. Prerequisite: 3463. Industrial and commercial recreation management: budgeting, facilities, programming and operational procedures.

4573 Leadership in Experiential Education. An investigation of leadership styles and management models with an application to adventure based education.

4580 Technical Management in the Wilderness. 1-6 credits, maximum 6. Development of technical competence in back country navigation, emergency medical care and evaluation, winter nordic mountaineering, technical rock climbing, hazard analysis and expedition planning.

**LIBRARY SCIENCE (LIBS)**

1011 The Use of Libraries and Learning Resources Centers. Orientation to the use of libraries and learning resources centers, including the special book and non-book features of the OSU library, basic materials and services.

3023 Management of School Libraries and Learning Resources Centers. Introduction to practical problems in management of library learning resources centers; state, regional and national standards; understanding of the functions, methods and routines necessary for the daily operation and supervision of the elementary or secondary school center; direction and training of student assistants, consideration of established library policy in school and community relationships.

3050 The School Library and Learning Resources Center in the Curriculum. 2-5 credits, maximum 5. Lab 1-3. Designed for teachers. Importance and effective utilization of the centralized school library media center in the teaching-learning process, evaluative selection tools of print and nonprint media, and reading guidance tools. Initial course is 2 credit hours. In addition, storytelling and field experience credits are available for 1-3 credit hours.

4113 Reference Materials. Selection, evaluation and use of basic reference materials most commonly used in all types of libraries; the organization of reference service; interpretation of reference questions.

4213 Selection of Book and Nonbook Materials. Selection principles, practices and problems in terms of library and learning resources centers objectives; evaluation of basic bibliographic aids and reviewing media involved in book and nonbook selection; analysis and practice of analysis and preparation of bibliographic card and index cards; annotation and other means of motivating reading.

4414 Introduction to Cataloging and Classification. Basic principles of cataloging, with practice based on functional application of current codes and manuals recognized by the profession.

4550 Special Studies in Libraries and Learning Resources Centers. 1-6 credits, maximum 6. Designed to meet individual and group needs of library education specialists, teachers and others, including enrichment tours and workshops or institutes.

4563 Bibliography of Special Fields. Prerequisite: consent of instructor. Bibliography of special fields. Emphasis on major trends and developments in subject bibliographies. Introduction to computer databases and print and computer data banks.

5713 Documents and Pamphlets Material. Introduction to the most-used governmental publications and indexes; selection, acquisition and care of pamphlets.

**MANAGEMENT (MGMT)**

2103 Business Computer Concepts and Applications. Prerequisites: 30 credit hours and MATH 1513. Computer concepts and applications. Introduction to programming, file structures, business software packages and issues in management information systems.

3013 Management. Prerequisites: completion of 50 credit hours and ACCTG 2203, ECON 2013, GENAD 2103, STAT 2023. Management principles and techniques of analysis. Decision making as applied to management systems, organizations, interpersonal relationships and production.

3103 Computer Programming for Business. Prerequisite 2103 or COMSC 2113 or equivalent. Computer programs for business applications using the COBOL language, file structures, file updating techniques, sorting and sorting report writing, magnetic tape and disk file handling.

3113 Management of the Public Organization. Applications of relevant management theory and tools of analysis to the problems of nonprofit organizations. Systems analysis, planning-programming-budgeting systems and cost-benefit analysis. Problems and examples are drawn from urban, government, military and educational organizations.
Prerequisites stressed.

3123 Organizational Behavior and Management. Prerequisites: 3013, and SCC 1112 or PSYCH 1113. Behavioral science concepts as they bear to the study of organizational and managerial behavior. Provides an understanding of the components and dynamics of organizational behavior essential to any manager. Managerial applications stressed.

3223 Production and Operations Management. Prerequisites: 3213. This course introduces students to the components and dynamics of organizational behavior essential to any manager. Managerial applications stressed.

3313 Business Systems Analysis. Prerequisites: 2103, 3103, ACCTG 2203. Systems analysis as a profession and the role of the systems analyst in the analysis, design, and implementation of computer-based business information systems. Current system documentation through use of classical and structured tools and techniques for describing flows, data flows, data structures, file designs, input and output devices, and program specifications. Information gathering and reporting activities and transition into system analysis and design.

4113 Labor Management Relations. Prerequisite: 3013. Policies and practices in labor relations. Focuses upon the functions of a human resource management department.

4123 Cost Accounting. Prerequisite: 3013. Cost behavior, cost-volume-profit relationships, cost accumulation, and cost accounting information for decision making.


4253 Data Base Management. Prerequisite: 4223. Theoretical and practical applications of data base file organization, and data models, with emphasis on hierarchical network and relational structures. Discussion of storage device, data base administration, and the analysis, design and implementation of data base management systems.

4313 Organization Theory and Development. Prerequisite: 3123. The design of formal organizations with an emphasis on topics related to organizational and managerial effectiveness. Focus on what is known about managerial and organizational effectiveness and how this knowledge may be applied.

4413 Management Systems Applications. Prerequisites: 3223, 4223. Survey of computer applications of data bases file organization and design. Development and implementation of complex computer-based decision models. Projects include data base utilization, optimization and report generation.


5333 Advanced Decision Theory for Management. Prerequisite: 5313 or equivalent. Case studies and examples involving decision analysis. Studies taken from current literature.

5413 Advanced Management Science. Prerequisite: 5313 or equivalent. Advanced management science methods, with computer applications. Mathematical programming, simulation, forecasting, queuing, Markov processes.

5513 Advanced Strategic Management and Business Policy. Prerequisite: MBA core courses. A terminal integrating course with emphasis on formulating and implementing basic policy decisions for business. An analytic approach to strategic decisions pursued through readings, cases and participation in a complex computer game.

5610 Quantitative Methods in Business. 3 credits, maximum 3. Prerequisites: MATH 2713; MATH 2813 or equivalent. Management orientation to decisions necessitated by the business environment. Impact of computer-based systems on control and auditing, total systems control analysis, and specific EDP auditing techniques as they apply to computer-based systems.

4000 MANAGEMENT INFORMATION SYSTEMS 3-6 credits, maximum 6. Prerequisites: doctoral student status and consent of instructor. Selected topics in human resource management and industrial relations issues.}

6200 Advanced Topics in Management Information Systems. 3-6 credits, maximum 6. Prerequisites: doctoral student status and consent of instructor. Special advanced topics in management information systems for doctoral students.

6500 Advanced Policy and Strategy Formulation. Prerequisites: doctoral student status and consent of instructor. Seminar examining research concerning the content of organizational strategy and the process through which it is formulated.


6713 Labor Relations and Collective Bargaining. A first course in labor relations. The industrial relations system, collective bargaining, labor legislation, the economic effects of unionization and other contemporary labor relations issues.

6813 Administration and Evaluation of Manpower Programs. Prerequisite: 4813 or ECON 5533. Advanced study of the operation, administration and effectiveness of various manpower programs. Allocation of decision-making processes among competing alternative programs and confidence in various evaluation techniques as a means of program improvement. Assessment of the long- and short-run effects of manpower programs in both the public and private sectors.

6210 Advanced Topics in Management Information Systems. 3-6 credits, maximum 6. Prerequisites: doctoral student status and consent of instructor. Selected topics in human resource management and industrial relations with emphasis on evaluation of research methods. Development of research proposals.

6343 Advanced Organization Theory and Strategy Implementation. Prerequisites: doctoral student status and consent of instructor. Selected topics in human resource management and social strategies and extent to which organizational structure, technology, culture, leadership, policies, and reward systems affect that process. Development of organization theory which are relevant to strategy implementation.
MANUFACTURING TECHNOLOGY (MFGT)

1432 Welding Processes. Lab 3. Welding processes, their basic principles, and the changes in mechanical properties that occur in welded structures. Application of oxyacetylene, metal arc, inert gas and other welding processes. Problems affecting the strength and other mechanical properties of welded structures.


2633 Welding Applications. Lab 3. Prerequisite: 1432. The applications of various welding methods to the fabrication of welded structures. Weldability of metals, selection of filler material, surfacing materials and the techniques required to make and test welds.

3033 Advanced Machining Principles. Lab 3. Prerequisites: GENT 1222, 1103, MATH 1613. Primary metal removal operations involving various machine tools. Metrology/quality, process selection, cost evaluation and optimization of cutting parameters; cutting tools used and forces generated.


3573 Production Processes. Lab 3. Prerequisites: GENT 1103, MATH 1513. Processes used by the manufacturing industries in the production of durable goods. Foundry, plastic, powder metallurgy, hot and cold forming, and welding. Techniques of design, application and selection.

4050 Advanced Manufacturing Problems. 1-4 credits. Maximum 4. Prerequisite: junior standing and consent of instructor. Special problems in manufacturing.

4303 Computer Integrated Manufacturing. Lab 3. Prerequisites: GENT 1103, 1222, MATH 1613. Introduction to programming techniques and manufacturing applications of Computer Numerical Control (CNC) and Robotics. Machine capabilities and tooling requirements; with programs being prepared manually and with COMPACT II computer assistance.

4313 Applied Robotics and Automated Manufacturing. Lab 3. Prerequisites: PHYS 1214 and EET 3103 or EPT 3103. Industrial applications of computer-controlled robotic and automated manufacturing equipment. Emphasis on machine characteristics, techniques of efficient utilization and control, and evaluation criteria.


4554 Advanced Metallurgical Problems. Prerequisites: 3343 and MECGT 4004. Problems in metallurgy: failure analysis, heat-treating problems and selection of metals for structural and environmental conditions.

MARKETING (MKTG)

3213 Marketing. Prerequisite: ECON 2023. Marketing strategy and decision-making. Consumer behavior, marketing institutions, competition and the law.

3323 Consumer and Market Behavior. Prerequisite: 3213. Qualitative and quantitative analyses of the behavior of consumers and market conditions. An introduction to the contributions of economics and the behavioral disciplines to consumer behavior.

3433 Promotional Strategy. Prerequisite: 3213. Promotional policies and techniques and their application to selling problems of the firm.

3513 Sales Management. Prerequisite: 3213. Sales planning and control, organization of the sales department, developing territories, motivating salesmen and control over sales operations.

3613 Retailing Management. Prerequisite: 3213. Applied marketing knowledge, with attention given to those concepts and methods which provide the necessary foundation for a retailing manager.

4113 Marketing Decision Analysis. Prerequisite: 3213. Decision making in a variety of marketing applications to include model building, analysis of courses of action, and development of online information systems. Applications with microcomputers to focus on decision areas such as sales forecasting, media selection, sales force allocation and site location.

4223 Business Logistics and Channel Management. Prerequisites: 3213 and MGMT 3223. An economic and operational analysis of the physical flow of goods and materials. A system interpretation of marketing channels.

4333 Marketing Research. Prerequisites: 3213 and STAT 3013. Basic research concepts and methods. Qualitative and quantitative tools of the market researcher.

4413 Problems in Marketing. Prerequisite: 3213. Problems in marketing. Specific topics vary from semester to semester.

4443 Social Issues in the Marketing Environment. Prerequisite: 3213. Social and legislative considerations as they relate to the marketplace.

4553 International Marketing. Prerequisite: 3213. The conceptual framework for marketing into and from foreign countries. The development of action-oriented strategies with emphasis on the uncontrollable factors that affect marketing decisions in an international setting.

4683 Managerial Strategies in Marketing. Prerequisite: 90 credit hours including 9 credit hours of marketing. Analysis of the marketing management decision process: market opportunity analysis, strategy development, planning and integration with corporate strategy.

5133 Marketing Management. Prerequisite: admission to MSA program. Consideration at an advanced level of the major elements of marketing from the point of view of the marketing executive. Emphasis on problem solving and decision-making, using an interdisciplinary approach. Development of an integrated, comprehensive marketing strategy.

5220 Seminar in Marketing. 3 credits, maximum 9. Prerequisite: 5133. Selected topics in marketing. Industrial marketing, product management, strategic marketing planning, international marketing, and services marketing.

5313 Marketing Research Methodology. Prerequisite: 5133. Research methodology applied to marketing problems. Measurement, survey research, experimentation, and statistical analysis of data.

5513 Seminar in Marketing Theory. Prerequisite: 5133 or consent of instructor. Development of an evaluation of marketing theory.

5613 Seminar in Consumer Behavior. Prerequisite: 5133 or consent of instructor. Psychological, sociological, and anthropological theories related to consumer decision processes. Special emphasis on current empirical research in consumer behavior.

5713 Seminar in Promotional Strategy. Prerequisite: 5133. Promotional problems encountered by a firm and approaches to their solution.

5813 Seminar in Channels of Distribution. Prerequisite: 5133. Distribution structure and interrelationships among managers of marketing channels involving customer service, physical distribution decisions, and operating policies.

MARKETING EDUCATION (MKTED)

2010 Career Exploration in Marketing Education. 1-2 credits. Maximum 2. Marketing concepts and occupational information within the framework of career exploration and decision-making. The modular design used to provide a variety of exploratory experiences in career decision-making, self-assessment and environments and skills involved in marketing.

3113 Foundations of Occupational Education. Occupational education and its development, role and function in a modern educational system. Economic and sociological foundations of various educationally oriented programs with specific information on serving students with multicultural backgrounds and specific needs. Same course as OAED 3113.

3253 Curriculum in Marketing Education. Prerequisite: MKTG 3213. The technical competencies in marketing education curriculum design demanded of marketing educators who prepare students for careers in retailing, wholesaling or service-selling fields.

3333 Marketing Education and Marketing Promotion. The promotional function in marketing education programs; competencies and skills in teaching advertising, display, publicity, public relations, and visual merchandising in all types of businesses.

3453 Organization and Administration of the Marketing Education Program. Prerequisite: CIED 2113. Designed to develop the competencies needed by the marketing education teacher-coordinator to organize and administer a comprehensive marketing education program, general or specialized, employing the cooperative or project (simulated) plan of instruction.

3543 Techniques of Teaching Salesmanship Skills. Development of the knowledge and skills to plan, develop and implement a competency-based marketing education salesmanship course.

3901 Seminar in Teacher Education. Procedures for gaining admission to Teacher Education and student teaching. Requirements for certification and graduation and course planning to meet those requirements. Career opportunities and procedures for securing employment. Same course as OAED 3901.

4103 Methods of Teaching Occupational and Adult Education. Lab 2. Prerequisite: OAED 3113. Applications of teaching and learning principles. Emphasizes the wide variety of instructional planning and delivery strategies available to the instructor, including shop and laboratory instruction, individualized and competency-based instruction, and the use of instructional technology. Laboratory component involves course participants in practical teaching and learning experiences.

4333 Principles of Teaching Business Management and Entrepreneurship. Principles of management and technology techniques appropriate for teaching these skills at the secondary school level.
5883* Advanced Media Management. Prerequisite: JM 4723 or consent of instructor. Trade area surveys; building and plant engineering; management of human, physical and financial assets; labor-management relations; estimating and cost controls.

5913* General Semantics in Mass Communication. Prerequisite: graduate standing or consent of instructor. Language affects thought and action, with special emphasis on writings of Johnson, Korzybski, Hayakawa, Chase and Lee in relation to communication media.

MATHEMATICS (MATH)

0123 Intermediate Algebra. Prerequisite: one year of high school algebra or equivalent. Review of fundamental concepts of elementary algebra, exponents and radicals, linear and quadratic equations, inequalities, introduction to analytic geometry. Does not count for degree credit.

1314 (A)General College Mathematics. Topics from set theory, logic, and probability. A general education course for non-majors. Not preparatory for subsequent mathematics courses.

1513 (A)College Algebra. Prerequisite: two years of high school algebra or 1213. Quadratic equations, functions and inequalities, theory of equations, exponential and logarithmic functions, theory of equations, sequences, permutations and combinations. No credit for those with prior credit in 1715 or any mathematics course for which 1513 is a prerequisite.

1613 (A)Trigonometry. Prerequisites: one unit of high school plane geometry, and 1213 or high school equivalent. Trigonometric functions, logarithms, solutions of triangles and applications to engineering. Credit for those with prior credit in 1715 or any course for which 1613 is prerequisite.

1715 (A)College Algebra and Trigonometry. Prerequisites: one unit of high school plane geometry, and 1213 or high school equivalent. An integrated course in college algebra and trigonometry. Credit limited to 3 hours for those with prior credit in 1513. No credit for those with prior credit in any course for which 1613 is a prerequisite.

2003 Discrete Mathematics I. Prerequisite: 1513 or 1715. Logic, set theory, proof techniques, probability and combinatorics, relations and functions, matrix algebra, graphs. Boolean algebra and lattices. Same course as COMSC 2203.

2265 Calculus I. Prerequisites: 1715, or 1513 and 1613. An introduction to derivatives, integrals and their applications, including introductory analytic geometry.

2365 Calculus II. Prerequisite: 2265. A continuation of 2265 including multivariable calculus, series and applications.

2373 Calculus for Technology Programs I. Prerequisites. 1715 or 1513 and 1613. First semester of a terminal sequence in calculus for students in the School of Technology. Calculus of trigonometric, exponential and logarithmic functions and applications to physical problems.

2383 Calculus for Technology Programs II. Prerequisite: 2373. Second semester of a terminal sequence in calculus for students in the School of Technology. Calculus of trigonometric, exponential and logarithmic functions and applications to physical problems.

2413 (A)Arithmetic for Teachers. Foundations of arithmetic for the elementary teacher.

2513 Structural Concepts for Teachers. Prerequisite, 2413 or equivalent. Structures of the number system, informal geometry. For the elementary teacher.


MATH 1223

2713 (A)Elementary Calculus. Prerequisite: 1513. An introduction to differential and integral calculus. For students of business and social sciences.

2813 (A)Finite Mathematics. Prerequisite: 2713. Discrete probability vectors and matrices and linear programming. For students of business and social sciences.

3013 Linear Algebra. Prerequisite: 2265. Algebra and geometry of finite-dimensional linear spaces, linear transformations, algebra of matrices, eigenvalues and eigenvectors.

3113 Introduction to Modern Algebra. Prerequisite: 2365. Modern algebra, including material on set theory and logic.

3203 Discrete Mathematics II. Prerequisite: 2203 or 3113. A continuation of MATH 2203, algebraic structure, coding theory, finite state machines, machine decomposability, computability, formal language theory. Same course as COMSC 3203.

3313* Essential Mathematics for the Biological and Social Sciences I. Prerequisites: 1213, and 60 credit hours or consent of instructor. Basic mathematics in the biological and social sciences. Selected topics from algebra, trigonometry and analytic geometry. Credit in this course and in 3413 may not be earned by those with credit in calculus.

3413* Elementary Mathematics for the Biological and Social Sciences II. Prerequisite: 3313. Selected topics from analytic geometry, polynomial calculus and matrix algebra. Applications to social and biological sciences.

3623* Linear Algebra and Analysis I. Prerequisite: 2365. An integrated treatment of linear algebra, differential equations and multivariable calculus. No credit for those with credit in 2613 or 3013.

3633 Linear Algebra and Analysis II. Prerequisite: 3623. Continuation of integrated treatment of linear algebra, differential equations and multivariable calculus begun in 3623. No credit for those with credit in 2613 or 3013.

3723 Mathematical Structures. Prerequisite: 1513 or equivalent. Foundations of numbers (set theory, numeration, and the real number system), number theory, algebraic systems, functions and applications, and probability.

3733 Geometric Structures. Prerequisite: 1513 or equivalent. Foundations of plane geometry, geometric notions (translation, rotations, reflections), polyhedra, applications to measurements.

4013 Engineering Math: Calculus of Several Variables. Prerequisites: 2613 and 3013. Differential and integral calculus of functions of several variables, vector analysis, other basic methods of analysis and applications.

4035 History of Mathematics. Prerequisite: 2265. Early development of mathematics as a science, contributions of Greek mathematics, mathematical advancements of the 17th and 18th centuries, and the mathematics of the 19th and 20th centuries. The emphasis in the course will be on replicating the setting and techniques of the times to understand the nature of a discovery and its relationship to contemporary thought.

4043* Geometry I. Prerequisite: 2265 or equivalent. An axiomatic development of Euclidean and non-Euclidean geometries including the following topics: points, lines, angles, measurement, betweenness, plane separation, triangles, quadrilaterals, polygons and circles.

4113 Modern Algebra. Prerequisite: 3113. Basic properties of groups, rings, polynomial rings and fields including homomorphism theorems and quotient structures.

4243 Theory of Numbers. Prerequisite: 3113. Divisibility of integers, congruences, quadratic residues, distribution of primes, continued fractions and the theory of ideals.
MECHANICAL AND AEROSPACE ENGINEERING (MAE)

3033* Mechanism Design. Prerequisite: ENGSC 2122. Motion programming and analysis of machines. Kinematics of cams, gear trains, and plane mechanisms. Introduction to symbolic logic.

3043 Intermediate Dynamics. Prerequisites: ENGSC 2122 and MATH 2613. A comprehensive treatment of the kinematics and kinetics of particles, systems of particles, rigid bodies from a Newtonian viewpoint, using rigorous vector techniques. An introduction to transient vibrations of mechanical systems and Lagrange's equations applied to mechanical systems.

3112* (L)Measurements and Instrumentation. Lab 2. 3723. Theory and laboratory in the measurement of electrical quantities, strain, force, velocity, frequency, temperature and flow rate. Report writing including the use of charts, graphs, diagrams and uncertainty analysis.

3226 Thermodynamics II. Prerequisite: ENGSC 2213. A continuation of ENGSC 2213. Irreversibility and availability, power cycles, refrigeration cycles, mixtures and solutions, chemical reactions, phase and chemical equilibrium, and introduction to compressible flow.

3323 Design Stress Analysis. Prerequisite: ENGSC 2114. The finite element method. Mechanics of deformable bodies with emphasis on the design of machine and structural members: general theories of stress and strain; stress-strain relations; theories of failure; reliability and safety factors in design; fatigue considerations.

3403 Computer Methods in Analysis and Design. Lab 3. Prerequisite: FORTRAN programming. Application of digital computer methods in the design, analysis, and simulation of mechanical, thermal, and fluid systems. Interactive computer graphics in conceptual design and presentation of design analysis results.


3732* Introduction to Dynamic Systems. Prerequisites: MATH 2613, ENGSC 2122 and 2613. Physical and mathematical modeling of electrical and mechanical dynamic systems. Transient response of first- and second-order systems. Laplace transform technique for solving differential equations; transfer functions; frequency response and resonance.

3733* (L)System Modeling, Simulation, and Design. Lab 3. Prerequisite: 3723 or ECEN 3723. Advanced modeling of mechanical engineering systems (mechanical, electromechanical, fluid and thermal). Numerical techniques for simulating system response. Model verification and identification, not ideal elements and nonlinear effects. Correlation of experimental results (laboratory studies of mechanical engineering systems) with simulation and analytic response predictions. Use of system modeling, analysis and simulation as a design technique.

4010 Mechanical Engineering Projects. 1-8 credits, maximum 12. Lab 6. Team projects selected on consent of instructor. Special projects and independent study in mechanical engineering.

4053* Introduction to Control Systems. Prerequisites: 3723, 3732 or ECEN 3723. Properties of feedback control systems, mathematical models of basic components, state-variable models of feedback systems, state-domain analysis, stability transform analysis, frequency-domain techniques, root-locus, design of single-input-single-output systems and simple compensation techniques.


4133* Mechanical Engineering Applications. Lab 6. Prerequisites: 3112 and consent of instructor. Application of mechanical engineering laboratory techniques to the solution of experimental or design problems. Provides outstanding senior students with the opportunity to do research under close faculty supervision. Projects selected in consultation with the instructor.


4243* Gas Power Systems. Prerequisites: 3223 and ENGSC 3253. Power and propulsion engines utilizing a gas as the working substance. Basic thermodynamic and dynamic equations of one-dimensional compressible flow, including isentropic flow and normal shock waves. Applications to both transportation and stationary systems.


4273* (L)Experimental Fluid Dynamics. Lab 3. Prerequisites: 3112 and ENGSC 3233. Experimental study of fundamental processes in aerodynamics and fluid dynamics using advanced measurement techniques.


4293 Compressible Fluid Flow. Prerequisites: ENGSC 3233 and MATH 2613. Gas flows in one and two dimensions; basic thermodynamic and dynamic equations, nozzle and duct flow, plane shock waves; transonic high-velocity flows and heat addition effects.

4323 Design for Manufacturing. Lab 3. Prerequisites: 3423, ENGSC 3533. Integration of concepts of product design with manufacturing principles, including behavior and properties of material, stress analysis, heat transfer and lubrication. Processing techniques and economics Emphasis on analysis requirements and applications of processing parameters and design variables, in CAD/CAM.

4333 Mechanical Metallurgy. Lab 2. Prerequisite: ENGSC 3313. Mechanical deformation processes and strengthening mechanisms in engineering materials. Material failure includes creep, fatigue, stress corrosion, ductile and brittle fractures.

4343* Industrial Projects. Lab 1. Prerequisites: 3033, 3043, 3112 and 3723. Student teams work on professional-level engineering projects sponsored by participating industries. Projects are selected from a broad range of technical areas such as mechanical design, thermal analysis, instrumentation, controls, fluid mechanics and energy production.

4353* Mechanical Design Analysis. Prerequisite: 3323. Analytical synthesis of machine components such as fasteners, springs, gears, brakes, bearings; lubrication; analytical methods for the study of impact, dynamic loading and fatigue; comprehensive treatment of failure, safety and reliability.

4363* (L)Experimental Analysis. Prerequisites: 3112 and 3323. Laboratory techniques for the experimental analysis of structures, materials, and systems. Emphasis on the use of strain gages, brittle lacquer techniques, reflection and transmission polariscopes, load cells and accelerometers.

4373 Aircraft Design. Prerequisites: 4243, 4253 and 4513. Solution of problems arising in the design of aerospace systems including engine, structural, control, propulsion and control characteristics.

4401 Seminar. Prerequisite: senior standing. Group discussions on professional aspects of engineering including ethical and legal concerns. Preparation of written and oral reports on selected and assigned topics.


4613 Fundamentals of Reservoir Engineering. Prerequisites: MATH 2613, CHENG 3473 or MAE 3813. Properties of porous media, properties and phase behavior of reservoir fluids. Computational schemes, including numerical methods, for predicting and optimizing production rates and establishing reserves.

4703* Indoor Environmental Systems. Prerequisites: ENGSC 3233. Application of engineering principles and practice of potential solutions to indoor environmental problems, including, but not limited to heating, cooling, ventilation, and air-moving systems including moisture control. Calculation of heating and cooling loads. Design of air distribution systems and selection of components.

5000 Thesis. 1-6 credits. Maximum 6. A student studying for a master's degree who elects to write a thesis must enroll in this course.

5010 Mechanical Engineering Projects. 1-12 credits, maximum 12. Project in research of design selected by the student, or assigned by the instructor. A student who wishes to complete a master's degree under Plan III must enroll in this course.

5030 Engineering Practice. 1-12 credits, maximum 12. Prerequisites: senior or graduate standing and consent of instructor. Analysis, design, testing, and development projects in actual or simulated industrial environments. Activities include application of design and testing procedures, economic evaluation and periodic oral and written reporting on one or more assigned problems. Activities must be approved in advance by the advisor.

5043* Advanced Dynamics. Prerequisites: 3043, MATH 3013. Advanced treatment of analytical methods for rigid body motion with emphasis on multi-dimensional motion. Newtonian formulations, LaGrange's equations, Euler's equations, the Poincaré construction, Hamilton's equations, Canonical transformations, spin stabilization, the rotation matrix, and Kane's formulations. Applications to engineering problems.

5073* Mechanical Vibrations. Prerequisite: 4063. Analysis of nonlinear vibrations, classical analysis of continuous systems and numerical methods.

5080 Engineering Acoustics. Acoustical analysis and measurement techniques, with emphasis on design applications for noise and vibration control in machinery and buildings.

5093* Numerical Engineering Analysis. Prerequisite: basic FORTRAN programming. Practical digital methods for obtaining steady-state and transient solutions to lumped and distributed conchonical and other problems.

5203* Inviscid Fluid Mechanisms. Prerequisite: ENGSC 3323. Basic principles and analytical methods underlying the theory of the motion of an inviscid and incompressible fluid.
5423* Fluid Dynamics. Prerequisite: 4233 or equivalent. The dynamics of viscous flow over external surfaces, inside channels, and in free shear layers. Boundary layer solutions. Theory of similarity. Approximation methods.  


5323 Plasticity and Metal Forming. Prerequisite: ENGRSC 2114 or equivalent. Basic theory of plasticity and its application to metal-forming problems. Application of computer-aided design (CAD) and computer-aided manufacturing (CAM) techniques in part and tool design and manufacture.  

5333 Advanced Manufacturing Processes. Prerequisite: ENGRSC 3313. Mechanical and thermal processing of materials-theory and applications. Solid-liquid transformation, solidification, microstructure and properties. Computer aided process model; design and simulation of processes. Recent advances in processing including RSP, HIP and near net shape for traditional and new materials.  

5373 Instrumentation. Lab 2. Analysis and design of instrumentation systems, laboratory experiences with electronic instrumention and transducers, application of digital and analog integrated circuit components to measurement problems.  

5403 Computer-Aided Analysis and Design. Prerequisite: basic FORTRAN proficiency. Theory, application and implementation of digital-computer-oriented algorithms for the synthesis, simulation, analysis and design of engineering systems. Advanced FORTRAN methods for optimization, simulation and data analysis. Implementation of these methods uses program libraries, batch processing, remote terminals and graphic display units.  

5413 Motion Programming of Planar Mechanisms. Prerequisite: 3033. An advanced course in the synthesis and analysis of plane mechanisms. Application of inversion theory, pole trajectory, and Robert’s law, overlay technique, Euler-Savary equation, Freudenstein’s equation and Kutzbach’s criterion.  


5433* Robotics: Kinematics, Dynamics and Control. Design and performance analysis of robots and manipulators as applied in flexible manufacturing and automation. Structural synthesis, kinematic and dynamic analysis, dexterity analysis, motion programming, and control system analysis and synthesis.  

5443 Lubrication, Friction and Wear. Prerequisite: ENGRSC 3233. Theories of lubrication, friction and wear; fundamentals of viscous fluid flow; the Navier-Stokes equations; Reynolds equations; hydrodynamic theory and applications to fixed, pivoted and thrust plane slider bearings, journal bearings, disks, gears; optimization of bearing performance; hydrodynamic squeeze theory and applications; analysis of hydrodynamic bearings; gas lubrication; solid friction and theories of adhesion and deformations; wear and theories of adhesion and abrasion.  

5453 Fluid Power Control I. Prerequisite: 4053 or concurrent enrollment. Static and dynamic modeling of hydraulic and pneumatic control systems and components. Entrainment and interference and impedance matching concepts. Dynamic performance and stability of open- and closed-loop servodrives. Introduction to system design.  


5473* Automatic Control I. Prerequisite: 4053 or ECEN 4413. Input-output and state space representations of linear continuous and discrete time dynamic systems. Controllability, observability, and stability. Design and analysis of single- and multi-variable feedback control systems. Introduction to identification, adaptive, and optimal control.  

5483 Digital Data Acquisition and Control. Lab 2. Prerequisite: undergraduate course in programming. Use of microcomputers operating in real-time applied to engineering systems for data acquisition and control, use of analog to digital, digital to analog, and digital input/output, synchronous and asynchronous programming. Computer in the engineering use of microcomputers through lectures and laboratory applications.  

5523* Photoelastic Stress Analysis. Prerequisite: 4363. Application of photoelastic methods to the stress analysis of machine parts and redundant structures. Techniques of casting, annealing and stress freezing. Use of transmission and reflecting types of polariscope.  

5533 Analysis of Structural Systems. Prerequisite: 4513. Computer-oriented matrix methods in the analysis of linear structural systems; energy principles; matrix equations for static and dynamic analyses of elastic systems; stability.  


5553 Fatigue and Fracture Mechanics. Prerequisite: 4333. Fracture processes in engineering materials including design and fracture evaluation; crack propagation; phase plane and fracture toughness, fatigue processes and high-strength, toughness- limited materials emphasized.  


5583 Corrosion Engineering. Lab 2. Prerequisite: ENGRSC 3313. Modern theory of corrosion and its applications in preventing or controlling corrosion damage economically and safely in service.  


5623 Energy Conversion Systems. Prerequisites: ENGRSC 2213 and 3233. A comparative study of conventional and alternative energy conversion systems, including economic and environmental concerns.  

5632 Applied Thermodynamics. First and Second Law analysis. Prediction of properties of nonideal fluids, including mixtures. Engineering applications to power systems, solar systems, HVAC systems, waste heat recovery and underground petroleum reservoirs.  

5643* Advanced Energy Resources Engineering. Application of the First Law of Thermodynamics, failure of superposition, phase plane and space phase techniques; method of perturbations; asymptotic, orbital and structural stability; subharmonic generation; generalized approaches to nonlinear systems analysis.  

5703 Artificial Intelligence and Expert Systems. Fundamentals: search-oriented problem solving, knowledge representation, logical inference, building an expert system, languages and software tools and machine architectures. Applications to planning, computer vision, natural language processing, speech recognition and robotics. Development of a prototype expert system or literature search and report is required. Common lectures with INDEN 5933 and ECEN 5293.  

5803 Advanced Thermodynamics I. Prerequisite: 3223. A rigorous examination of the fundamental principles of engineering thermodynamics; the First Law, the pure substance approach; availability properties of substances, thermodynamics, chemistry, mixtures and equilibrium.  

5823* Radiation Heat Transfer. The mechanism of the transfer of energy by thermal radiation; radiant properties of materials, energy transfer prediction methods and solar energy topics.  

5843* Conduction Heat Transfer. Prerequisite: ENGRSC 3233. Advanced heat transfer analysis and design, with primary emphasis on conduction.  

5853* Advanced Indoor Environmental System. Prerequisite: 4703. Heating, cooling, and ventilating systems. System and component design, building thermal simulation and energy calculation procedures.  

5923* Guidance and Control of Aerospace Vehicles. Prerequisite: 4053 or ECEN 4413 or equivalent. Navigation, guidance and attitude control of aircraft, launch vehicles and spacecraft; inertial navigation mechanizations and error analysis. Stability augmentation systems.  

5933 Aeroelasticity. Prerequisites: 4063, 4283, 4523. Interaction between aerodynamic, inertial and elastic forces. Influence of eigenvalues and eigenvectors. Calculations of the normal modes and frequencies of flexible airplane and missile structures. Deformation of structures under dynamic loads by rigorous and approximate methods of analysis.  

5943 Jet and Rocket Propulsion. Prerequisite: 4243. Thermodynamic and aerodynamic principles applied to jet and rocket engines. Engineering principles of rocket propulsion. Component matching for jet engines and rocket engines, design of ramjet inlets; solid and liquid rocket fuels; rocket components and controls; rocket energy requirements for orbital and interplanetary flight.  

6000 Research and Thesis. 1-15 credits, maximum 30. Prerequisites: consent of the head or the graduate committee. Independent research under the direct supervision of a member of the graduate faculty. For students pursuing study beyond the level of the M.S. degree.  

6010* Advanced Study. 1-12 credits. Prerequisite: approval of the head or the graduate committee. Study and investigation under the supervision of a member of the faculty along lines of interest well advanced of and supported by the 5000-series courses.  


6233* Turbulent Fluid Dynamics. Prerequisite: 5233. Isotropic turbulence, turbulent wakes and jets, boundary layer shear flows, transition, hydrodynamic stability and turbulence calculation methods for turbulent boundary layers.  

6263* Computational Fluid Dynamics. Prerequisite: 5233. Shock-tube/vortex dynamics and pressure-velocity simulations of incompressible and compressible flows. Temperature and concentration solutions. Applications to various external and internal flow problems.  

6333* Advanced Topics in Materials Processing. Lab 3. Prerequisite: 5333. Modeling of non-linear problems in solidification heat transfer, thermo-mechanical deformation and material removal. Simulation of solidification and casting processes. Application of computer methods including finite difference and finite element techniques. Experimental verification and processing parametric studies conducted in the materials processing lab. Tours of industry to provide additional processing background.
MECHANICAL DESIGN TECHNOLOGY (MECDT)

1223 Computer-aided Drafting and Design. Lab. 4. Prerequisite: GENT 1153 or equivalent. Computer-aided drafting and design for representation of mechanical and electronic drawings. BASIC language, programming, spreadsheets, and data base use.

1843 Descriptive Geometry. Lab. 6. The graphical analysis of points, lines and planes in space with practical applications to engineering working drawings.

2053 Pipe Drafting. Lab. 6. Prerequisite: GENT 1153 or equivalent. Design and layout of piping systems.

2113 Technical Illustration. Lab. B. Prerequisite: 2213 or consent of instructor. Pictorial drawing with applications to industrial production work.

2213 Machine Drafting. Lab. 6. Prerequisites: 1223, GENT 1153 or equivalent. Detail and assembly drawings of machines and products using drafting machines and computer-aided drafting techniques.

2743 Electronics and Electrical Drafting. Lab. 6. Prerequisite: MATH 1513 or equivalent. Conventional preparation of graphical illustrations in the design and construction of electronic equipment.

3003 Dynamics. Prerequisites: GENT 2323 and MATH 2373. Plane motion of particles and rigid bodies. Force, acceleration, work-energy, and impulse-momentum principles. Graphical analysis, mechanisms, and vibrations.


3123 Product Design. Lab. 5. Prerequisites: 1843 and GENT 1222. Industrial design functions and techniques, the creative process in product design innovations and improvements, human factors (man/machine interface) and techniques in graphic and model presentations of design concepts.

3152 Structural Fabrication Design. Lab. 3. Prerequisites: GENT 1153 and PHYS 1114. The application standards for detailing and fabrication of structural materials.


3563 Production Planning. Lab. 3. Prerequisites: GENT 1103, 1153, and 1222Z Basic forecasting, planning and control of industrial production.

3883 Tool Design. Lab. 3. Prerequisites: 2113, GENT 1222. Basic design and development of special tools for processing engineering materials.

4003 Machine Design I. Prerequisites: 3323, COMSC 2113, and MATH 2383. Applications of statics and strength to the design of machine components. Problems of choosing materials, impact and fatigue loading.


4500 Advanced Mechanical Design Problems. 1-4 credits, maximum 4. Prerequisite; junior standing and consent of instructor. Special problems in mechanical design.

4123 Senior Design Projects. Lab. 6. Prerequisites: 3123, 4003 and ENGL 3323. Selected problems in design integrating principles of drafting, analysis, materials and manufacturing. Design projects are typically supplied by industry.

4203 Machine Design II. Lab. 6. Prerequisites: 3323, COMSC 2113, and MATH 2383. A continuation of 4003 emphasizing the design of machine components such as gears, bearings, fasteners, springs, and weldments.

4213 Kinematics and Mechanisms. Lab. 6. Prerequisites: 3003, COMSC 2113, GENT 1153. Analysis and design of mechanisms such as the 4-bar linkage, slidercrank, cam and gear. Graphical techniques are emphasized.

MECHANICAL POWER TECHNOLOGY (MPT)

1103 (L) Introduction to Prime Movers. Lab. 2. Prime movers as used in the industrial world. Basic principles of design, construction, and operation of internal combustion engines, turbines, electric and hydraulic motors. Laboratory practices in inspection, measurement, and comparisons of characteristics.


2133 Diesel Engines and Injection Systems. Lab. 2. Prerequisite: 1105. Compression ignition engines and fuel injection systems. Laboratory practice in inspection, adjustment, timing and testing of fuel injection systems. Diesel and spark ignition compared.

2313 Fundamentals of Hydraulic Fluid Power. Lab. 3. Prerequisites: MATH 1513 and basic fluid power concepts. Standard hydraulic symbols, component design and application, fluid power system considerations, design and operation.

3114 Basic Instrumentation. Lab. 4. Prerequisite: MATH 2373. Data analysis. Theory, operational characteristics and application of transducers for measurement of strain, force, velocity, acceleration, displacement, time, frequency, temperature, pressure, fluid flow, vibrations and constituent analysis.

3123 Thermodynamics and Heat Transfer for Electronics. Lab. 3. Prerequisites: MATH 2383 and junior standing. Principles of thermodynamics and heat transfer important to the design, construction and operation of electronic systems. Basic heat transfer by conduction, convection, and radiation. Heat removal from electronic systems by heat-sinking, free air-convection, forced-air convection and combinations. Identification of specific overheating problems in electronics systems and the design of appropriate heat removal techniques.

3202 Transportation Problems. Prerequisite: 2133. An economic study of the transportation industry; selecting and operating commercial vehicles. Federal and state regulations of commercial transportation. Highway financing.

3313 Applied Fluid Mechanics. Prerequisites: 2313, MATH 2373, and PHYS 1214. Fluid mechanical principles applied to fluid power systems and general fluid systems. Fluid systems analysis using Bernoulli and general energy equations, laminar and turbulent flows, flow and pressure measurement, flow forces, lift and drag.

3322 Fuels and Lubricants. Lab. 3. Prerequisite: 1105. Chemical structure; recognized tests and practical applications of petroleum-based fuels and lubricants. Combustion problems in spark-ignition and compression-ignition engines and auxiliary industrial equipment.

3433 Basic Thermodynamics. Prerequisite: concurrent enrollment in MATH 2373. Basic scientific principles of energy and the behavior of substances as related to engines and systems. Gas laws, vapors and engine cycles.

3553 Gas Turbine Powerplant. Lab. 3. Prerequisite: 3433. Major engine sections including accessories and systems. Student participation in engine disassembly, inspection, assembly, operation and testing.

4050 Advanced Technology Problems. 1-4 credits, maximum 4. Prerequisites: junior standing and consent of department head. Special technical problems in a mechanical power area.


4443 Power Station Technology and Design. Prerequisite: 3433. Steam, hydro and internal combustion power plants, technical design, energy balance and economic evaluation.

4453 Advanced Internal Combustion Engines. Prerequisites: 3114 and 3433. Advanced internal combustion engine theory: real cycles, mixtures, combustion, balancing and associated engine systems.

4463 Thermodynamics Laboratory. Lab 6. Prerequisite: 3433. Application of thermodynamic principles to vapor power cycles and gas power cycles.

4473 Senior Design Project. Lab 6. Prerequisite: senior standing. Selected problems in design, combining principles of drafting; analysis, materials and fabrication methods. Design projects typically supplied by industry.

MECHANIZED AGRICULTURE (MECAG)

1413 Introduction to Engineering in Agriculture. Prerequisite: MATH 1513 of concurrent enrollment. Application of the physical and engineering sciences to agricultural problems. Energy; energy conversion: thermal, electrical, mechanical and fluid systems; equipment calibration; environmental control of agriculture buildings and irrigation system requirements.

2202 Conservation Surveys and Technology. Lab 2. Use of the farm level; mechanical methods of erosion control including terracing and farm-pond planning.

2162 Electricity In Agriculture. Lab 2. Prerequisite: MATH 1513. Electricity applied to the farm and rural home including farmstead distribution and use and National Electric Code. Course requirements include laboratory activities include simple circuits, practical wiring, home wiring planning, electric motors and controls.

3173* Buildings for Agriculture. Lab 2. Prerequisite: MATH 1213. Planning and selection of buildings and equipment for agriculture, including functional, environmental and structural requirements. Laboratory activities include materials selection, materials testing, wind and solar effects and farmstead planning.

3213 Metal and Woodworking Skills. Lab 3. Machine nomenclature and maintenance; workshop planning; operations including welding, metal working, wood working and framing, and concrete.

3223 Irrigation and Welding. Lab 3. Prerequisite: 1413. Essential knowledge and theory necessary for understanding the principles of hot and cold metals and welding. Laboratory provides opportunity to apply and develop associated skills.

3233 Tractor Power Principles. Lab 2. Prerequisite: MATH 1513. The principles, operation, performance, maintenance and management of agricultural tractors. Two-stroke and four-stroke cycle gasoline and diesel engines. Laboratory activities involve engines, power trains, hydraulic systems, electrical systems and tractor performance.

3313 Introduction to Soil and Water Conservation Engineering. Lab 3. Prerequisite: MATH 1513. Topographic and construction surveying. Planning, analysis and layout of soil and water conservation facilities including drainways, terraces, ponds, drainage systems, erosion control facilities and water wells.

3342 Field Machinery. Prerequisites: MATH 1513, PHYS 1251. Machine elements and machine performance as related to crop production. Selection of farm machinery for crop production systems.

4123 Principles of Food Engineering. Prerequisite: MATH 1513. For non-engineers. Application of the engineering approach to solving heat and mass transfer problems in food processing. An introduction to the basic concepts of the conservation laws, fluid flow, heat transfer, refrigeration, freezing, psychrometrics, and energy conservation.

4260 Topics in Mechanized Agriculture. 1-4 credits, maximum 4. Investigations in specialized areas of mechanized agriculture.

4203* Irrigation Principles. Prerequisite: MATH 1513. Sources, measurement and efficient use of irrigation water. Selection of pumping plants and power units. Layout and management of surface and sprinkler systems.

4220 Advanced Methods in Agricultural Mechanics. 1-6 credits, maximum 6. Prerequisite: 4222. Developing agricultural mechanics programs for vocational agriculture and technical schools. Application of agricultural mechanics methods, practices and skills to advanced projects.

4222 Farm Mechanics: Organization and Methods. Lab 2. Prerequisite: 3223. Required of agricultural education majors. Organizing the farm mechanics program and methods used in teaching farm mechanics. Shop skills and project work.


MEDICAL TECHNOLOGY (MTCL)

4117 Clinical Microbiology. Lab 12. Prerequisites: concurrent internship in affiliated hospital and all degree requirements for B.S. in medical technology except 30 hours MTCL. Theory and laboratory methodology of analytical biochemistry, clinical microbiology, routine and special procedures, and medical significance.

425** Immunology. Lab 3. Prerequisite: 2124. Vertebrate host’s ability to defend itself against foreign invasion. Chemistry and biology of the acquired immune response.

4326 Industrial Microbiology. Lab 4. Prerequisite: 3124. Production of solvents, vitamins, amino acids, antibiotics, flavored products, etc. Biodegradation of industrial wastes, pesticides, and herbicides. Microbial aspects of energy production, including petroleum microbiology.

4000 Honors in Medical Technology. 1-4 credits, maximum 10. Prerequisite: permission of departmental honors committee. Supervised study and research in microbiology.

4113* Microbiology of Soil. Lab 6. Prerequisite: 2124. Microorganisms of the soil and their relationship to soil fertility.

4124* Virology. Lab 4. Prerequisites: BISC 3014 or one course in biochemistry and one upper division MICRO course. The laboratory practice of virus host interactions including structure-function of animal, plant, and bacterial viruses. Same course as PLP 4124.

4133 Current Topics in Microbiology. Lab 2. Prerequisite permission of instructor. Subject matter may vary from year to year as new knowledge and techniques develop. Inquire as to current subject offering.

414** Laboratory Techniques. Lab 6. Prerequisites: 3124, one semester of organic chemistry. Theory and current techniques employed in diagnostic and research laboratories.

4990 Special Problems. 1-4 credits, maximum 4. Prerequisite: consent of instructor. Minor investigations in the field of microbiology.

*Approved for Graduate Credit

MICROBIOLOGY (MICRO)

2124 (L)Introduction to Microbiology. Lab 4. Prerequisites: one year of chemistry; and BISC 1304, and 1403 or 1603. General principles of microbiology.

3124* Microbial Ecology. Lab 4. Prerequisites: 2124 and one semester of organic chemistry. Roles of microbes in biochemical cycles and energy transfers.

3133 Genetics of Microorganisms. Prerequisites: 2124 and one semester of organic chemistry. Molecular and genetic approaches to the study of microorganisms.

3134* Pathogenic Microbiology. Lab 3. Prerequisite: 2124. Examination of pathogenic bacteria as they relate to humans, other animals, plants and insects. Same course as PLP 3134.

3143 Medical Mycology. Lab 4. Prerequisite: 2124. Examination of fungi as animal pathogens; laboratory techniques used in the identification of human and animal pathogens, and differentiation from common contaminants.

3153 Medical Parasitology. Lab 2. Prerequisite: introductory biology. Human and parasitological problems including endemic, exotic and zoonotic organisms. Life cycles, diagnosis and control procedures. Principles applicable to all areas of zoology, medicine, veterinary medicine and medical technology.

3154 Food Microbiology. Lab 4. Prerequisites: 2124 and organic chemistry. Relationship of microorganisms to food manufacturing and preservation, to food spoilage and microbial food poisoning and to various aspects of primary food production.

2354* Immunology. Lab 3. Prerequisite: 2124. Vertebrate host’s ability to defend itself against foreign invasion. Chemistry and biology of the acquired immune response.

3260 Industrial Microbiology. Lab 4. Prerequisite: 3124. Production of solvents, vitamins, amino acids, antibiotics, flavored products, etc. Biodegradation of industrial wastes, pesticides, and herbicides. Microbial aspects of energy production, including petroleum microbiology.

4000 Honors in Microbiology. 1-4 credits, maximum 10. Prerequisite: permission of departmental honors committee. Supervised study and research in microbiology.
MILITARY SCIENCE (MILSC)

1000 Land Navigation and Orienteering. 1 credit, maximum 1. Lab 1. Land navigation through interpretation of maps, use of compass and terrain association. Introduction to the olympic sport of orienteering through practical exercise and classroom training.

1111 Survey of Military Science. History and organization of the Army and Reserve Forces and their role in the National Defense policy. Legal, moral, and ethical responsibilities of the military officer. Reserve Officers Training Program and methods of commissioning. Exposure to military skills such as rappelling and first aid.

2111 Leadership. Leadership theories, leader and follower roles, principles and traits of leadership, communications, problem solving, motivation, and self development. Taught through group discussion and practical exercises in leadership skills.

2000 Rappelling and Survival. 1 credit, maximum 1. Lab 1. Rappelling and survival techniques for outdoor living in a military environment. Outdoor practical exercises are required.

2330 Leadership and Military Skills II. 1-3 credits, maximum 3. Lab 2. Leadership and individual military skill development. Theory and tactics for military operations; individual skill training in rappelling, communications, physical fitness, and leadership. Taught through a combination of classroom instruction and outdoor practical application exercises. Some laboratories will be on selected weekends by arrangement.

2310 Leadership and Military Skills I. 2-3 credits, maximum 3. Lab 2. Prerequisite: 2230. Leadership, management and military skill development. Theory and tactics for military operations; individual skill training in management and problem solving, land navigation, first aid, rappelling and partolling. Taught through a combination of classroom instruction and outdoor practical application exercises. Some laboratories will be on selected weekends by arrangement.

2320 Fundamentals of Military Operations. 1-3 credits, maximum 3. Lab 2. Prerequisite: 1111 or advanced placement by department head. Course geared for leadership and individual military skill development. Taken in lieu of 2230 and 2310 with department head approval. Theory and tactics for military operations taught through classroom lecture and outdoor practical application exercises. Some laboratories will be on selected weekends by arrangement.

3112 The Platoon Leader I. Lab 2. Prerequisites: completion of lower-division ROTC program or basic ROTC summer camp or equivalent, qualification by physical and aptitude standards set by Department of the Army and approval of PMS. The functional role of the platoon leader with practical work in leadership and decision making, introduction to small-unit tactics in platoon offensive operations. Some laboratories will be on Saturdays by arrangement.

3223 The Platoon Leader II. Lab 2. Prerequisites: completion of lower-division ROTC program or basic ROTC summer camp or equivalent, qualification by physical and aptitude standards set by Department of the Army and approval of PMS. Platoon defensive operations, patrolling, communications, land navigation and map reading, branches of the Army and the officer personnel management system. Some laboratories will be on Saturdays by arrangement.

4014 Advanced Summer Camp. Lab. Prerequisites: 3112 and 3223. Military training and performance as leaders for six weeks.

4123 Contemporary Command Issues and Management. Lab 2. Prerequisites: 3112 and 3223. Staff organization and procedures, preparing and conducting military training, effective speaking and presentation. Discussion of other contemporary issues critical to integration of newly commissioned officers.

4222 Military Ethics and Professionalism. Lab 2. Prerequisites: 3112 and 3223. Special obligations and responsibilities of the military profession. In-depth study of military justice as it relates to the new officer. Discussion of military ethics with case studies.
1320 Major Guitar. 1-4 credits, maximum 8.
1330 Major Harp. 1-4 credits, maximum 8.
1340 Major Flute. 1-4 credits, maximum 8.
1350 Major Oboe. 1-4 credits, maximum 8.
1360 Major Clarinet. 1-4 credits, maximum 8.
1370 Major Saxophone. 1-4 credits, maximum 8.
1380 Major Bassoon. 1-4 credits, maximum 8.
1390 Major Trumpet. 1-4 credits, maximum 8.
1400 Major French Horn. 1-4 credits, maximum 8.
1410 Major Trombone. 1-4 credits, maximum 8.
1420 Major Euphonium. 1-4 credits, maximum 8.
1430 Major Tuba. 1-4 credits, maximum 8.
1440 Major Percussion. 1-4 credits, maximum 8.

1513 Music Literature. Music of the Baroque, Classical, Romantic, and Contemporary periods, with emphasis on style analysis.
1531 Sightsinging and Eartraining I. Prerequisites: 2672 or successful completion of Music Theory Placement Examination. Development of skills in sightsinging and aural perception. Taken concurrently with MUSIC 1533.
1532 Theory of Music I. Prerequisite: Successful completion of Music Theory Placement Examination. Choral and instrumental writing and analysis correlated with keyboard skills. Taken concurrently with MUSIC 1531.
1541 Sightsinging and Eartraining II. Prerequisites: 1533 and 1531. A continuation of 1531. Taken concurrently with 1543.
1542 Theory of Music II. Prerequisites: 1533 and 1531. A continuation of 1533, taken concurrently with 1541.
1592 Introduction to Reading and Writing Music. Scales, keys, intervals and triads with introductory sight singing, dictation and keyboard skills. No credit for students with prior credit in 2672.

2011 Piano Class Lessons. Prerequisites: 1021 and music major status. Class lessons for music majors (non-keyboard concentration) preparing for the piano proficiency examination.
2021 Piano Class Lessons. Prerequisites: 2011 and music major status. Successful completion of the course fulfills piano proficiency examination requirement for music majors (non-keyboard concentration).
2041 Vocal Techniques. Prerequisite: 1031. Assists non-vocal majors in understanding the physical and psychological processes required for correct singing tone production.
2061 Low Strings Techniques. Lab 2. Methods for playing and teaching the cello and double bass.
2091 Low Brass Techniques. Lab 2. Methods for playing and teaching the trombone, euphonium, and tuba.

2250 Major Organ. 1-6 credits, maximum 12. Prerequisite: 1250.
2260 Major Piano. 1-6 credits, maximum 12. Prerequisite: 1260.
2270 Major Voice. 1-6 credits, maximum 12. Prerequisite: 1270.
2280 Major Violin. 1-6 credits, maximum 12. Prerequisite: 1280.
2290 Major Viola. 1-6 credits, maximum 12. Prerequisite: 1290.
2300 Major Cello. 1-6 credits, maximum 12. Prerequisite: 1300.
2310 Major Double Bass. 1-6 credits, maximum 12. Prerequisite: 1310.
2320 Major Guitar. 1-6 credits, maximum 12. Prerequisite: 1320.
2330 Major Harp. 1-6 credits, maximum 12. Prerequisite: 1330.
2340 Major Flute. 1-6 credits, maximum 12. Prerequisite: 1340.
2350 Major Oboe. 1-6 credits, maximum 12. Prerequisite: 1350.
2360 Major Clarinet. 1-6 credits, maximum 12. Prerequisite: 1360.
2370 Major Saxophone. 1-6 credits, maximum 12. Prerequisite: 1370.
2380 Major Bassoon. 1-6 credits, maximum 12. Prerequisite: 1380.
2390 Major Trumpet. 1-6 credits, maximum 12. Prerequisite: 1390.
2400 Major French Horn. 1-4 credits, maximum 8. Prerequisite: 1400.
2410 Major Trombone. 1-6 credits, maximum 12. Prerequisite: 1410.
2420 Major Euphonium. 1-4 credits, maximum 8. Prerequisite: 1420.
2430 Major Tuba. 1-6 credits, maximum 12. Prerequisite: 1430.
2440 Major Percussion. 1-6 credits, maximum 12. Prerequisite: 1440.
2510 Sightsinging and Eartraining III. Prerequisites: 1541 and 1543. Further development of skills in sightsinging and aural perception. Taken concurrently with 2553.
2553 Theory of Music III. Lab 1/2. Prerequisites: 1541 and 1543. Choral and instrumental writing correlated with sight singing, melodic and harmonic dictation and keyboard skills. Taken concurrently with 2551.
2551 Sightsinging and Eartraining IV. Prerequisites: 2551 and 2553. A continuation of 2551. Taken concurrently with 2563.
2563 Theory of Music IV. Lab 1/2. Prerequisites: 2551 and 2553. A continuation of 2553. Taken concurrently with 2561.
2573 (H) SpD Introduction to Music. Instruments, musical forms and styles, and major composers from the 18th Century to the present. For non-majors; no prior musical experience required.

2580 Music in Life: Selected Topics. 2-6 credits, maximum 6. Acquaints general University students with the forms and composers of 20th Century art music, jazz, and music in the United States in three separate sections.
2600 Chamber Ensembles. 1 credit, maximum 8. Lab 2. Combination of voices, keyboard, and orchestral instruments for performing chamber music, music theater and duo piano repertoire.
2610 University Bands I. 1-2 credits, maximum 6. Lab 3-5.
2620 Symphony Orchestra I. 1-2 credits, maximum 6.
2630 University Choral Ensembles I. 1-4 credits, maximum 6.
2672 Fundamentals of Music. Accepted for certificate/license in elementary education Fundamentals of music, sight, singing, and piano keyboard. No credit for students with prior credit in 1592.
2682 Music Education. Prerequisite: 2672. For certificate/license in elementary education. Methods of teaching music in grades K-6.
2713 Music and the Arts. Dominant themes of human self-expression as discovered through study of music and its integration with art and culture from the late Middle Ages to the early 20th Century with emphasis on the humanistic ideas they embody.
3110 Elective Organ. 1-4 credits, maximum 8. Prerequisite: 1110.
3120 Elective Piano. 1-4 credits, maximum 8. Prerequisite: 1120.
3130 Elective Voice. 1-4 credits, maximum 8. Prerequisite: 1130.
3140 Elective Brass. 1-4 credits, maximum 8. Prerequisite: 1140.
3150 Elective String. 1-4 credits, maximum 8. Prerequisite: 1150.
3160 Elective Woodwind. 1-4 credits, maximum 8. Prerequisite: 1160.
3170 Elective Percussion. 1-4 credits, maximum 8. Prerequisite: 1170.
3180 Secondary Organ. 1-2 credits, maximum 8. Prerequisite: 1180.
3190 Secondary Piano. 1-2 credits, maximum 8. Prerequisite: 1190.
3200 Secondary Voice. 1-2 credits, maximum 8. Prerequisite: 1200.
3210 Secondary Brass. 1-2 credits, maximum 8. Prerequisite: 1210.
3220 Secondary String. 1-2 credits, maximum 8. Prerequisite: 1220.
3230 Secondary Woodwind. 1-2 credits, maximum 8. Prerequisite: 1230.
3240 Secondary Percussion. 1-2 credits, maximum 8. Prerequisite: 1240.
3250 Major Organ. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2250.
3260 Major Piano. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2260.
3270 Major Voice. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2270.

*Approved for Graduate Credit
Major Cello. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2290.

Major Double Bass. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2310.

Major Flute. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2340.

Major Harp. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2350.

Major Clarinet. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2360.

Major Saxophone. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2370.

Major Bassoon. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2380.

Major Trumpet. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2390.

Major French Horn. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2400.

Major Trombone. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2410.

Major Euphonium. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2420.

Major Tuba. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2430.

Major Percussion. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2440.

Pre-clinical and Laboratory Experiences in Music. Prerequisites: declared intent to pursue Teacher Education program. Observation and micro-teaching in music.

University Bands II. Lab 3-5, 1-2 credits, maximum 6. Prerequisite: 4 hours of 2610.

Symphony Orchestra II. Lab 4, 1-2 credits, maximum 6.

University Choral Ensembles II. 1-4 credits, maximum 6. Prerequisite: 4 hours of 2530.

Basic Conducting. Principles of conducting choral and instrumental groups.

Evaluation Techniques for the Ensemble Conductor. Prerequisite: 3712. Studies in diagnostic, and achievement evaluation techniques appropriate for the school musicians in ensemble situations.

Introduction to Elementary Music Education. Orientation to methods (including Orff, Kodaly, Dalcroze, and Manhattanville Music Curriculum Project) appropriate for teaching music in the elementary school.

Foundations of Music Education. Interdisciplinary approach including aspects of philosophy, aesthetics, sociology and psychology as they are applied in music in post-elementary public schools.
NATURAL SCIENCE (NATSC)

5050 Report. 1-2 credits, maximum 2. Prerequisite: enrollment in program leading to M.S. in natural science. Graduate in reading and research required for M.S. in natural science degree.

OCCUPATIONAL AND ADULT EDUCATION (OAED)

3012 Analysis and Assessment of Training Needs. Prerequisite: 3113 or TECED 3103 or TIED 3203. Techniques and procedures used in determining needs for, and content of, instructional programs. Emphasis on needs-assessment techniques and methods for identifying and analyzing the knowledge, skills and competencies required for satisfactory job performance. Procedures for translating such information into instructional programs. No credit for students with credit in TIED 4344.

3113* Foundations of Occupational Education. Characteristics of occupational education and its theoretical role and function in a modern educational system. Economic and sociological foundations of occupationally oriented programs plus specific information on serving students with multicultural backgrounds and specific needs. Same course as MKTED 3113.

3143 Career Education: An Introduction. Introduce current and prospective teachers to the fundamental concepts and operational practices of career education. Historical development, needs assessment, goals, implementation strategies, evaluation, developmental concepts, curriculum planning and articulation.

3901 Seminar in Teacher Education. Procedures for gaining admission to Teacher Education and student teaching. Requirements for certification and graduation and course planning to meet those requirements. Career opportunities and procedures for securing employment. Same course as MKTED 3901.

4010 Occupational and Adult Education Workshop. 1-3 credits, maximum 6. Professional workshops of various topics and lengths. Each workshop focused on a particular topic from such areas as the development, use and evaluation of instructional methods and materials.

4103 Methods of Teaching Occupational and Adult Education. Lab 2. Prerequisite: 3113. Applications of teaching and learning principles. Instructional planning and delivery strategies available to the instructor, including shop and laboratory instruction, individualized and competency-based instruction and the use of instructional technology. Laboratory component involves course participants in microteaching and actual site teaching. Same course as MKTED 4103. No credit for students with credit in TIED 4103.

4223 Program Planning and Development in Occupa- tional and Adult Education. Prerequisites: 3113 and 4103. Planning and designing programs for the development of human resources. Program goals and objectives, curriculum, facilities, inclusion of community needs, development of program resources and program and instructional evaluation.

4333 (I)International Occupational Education. Comparison and analysis of international occupational education.

4470 Teaching Practicum in Occupational Education. 1-12 credits, maximum 12. Prerequisites: admission to Teacher Education, MKTED 3253, 4103, and enrollment in or concurrent enrollment in MKTED 3453. Organized teaching experiences under the guidance and direction of a local school cooperating teacher and university teacher educator. Participant assigned to a cooperating teacher with responsibility for planning, implementing and evaluating the classroom, laboratory or shop. Same course as MKTED 4470.

5000 Masters Thesis or Report. 2-6 credits, maximum 6. Students studying for a master's degree and writing a report enroll in this course for two credit hours. Enrollment is for six credit hours if a thesis is written.

5010 Seminar. 1-3 credits, maximum 6. Graduate student seminars focusing on current and critical issues and common problems relevant to occupational and adult education.

5113 Principles of Occupational and Adult Education. Underlying principles and evolving concepts in occupational and adult education. Critical analysis of educational programs and services and the resultant implications for leadership personnel at all levels of program responsibility.

5123 Program Evaluation In Occupational and Adult Edu- cation. Prerequisite: background in a vocational area. The purpose of evaluation in occupational and adult education programs with specific attention given to the evaluation program development in laboratory and shop instruction.


5203 Foundations of Adult and Continuing Education. Societal trends, issues and institutions which have influenced the development and current status of adult and continuing education. Analyzes and critiques of contemporary adult and continuing education activities, materials and curricula and the methods of evaluation of new and existing programs in the field.

5213 Characteristics of Adult Learners. Learning patterns, interests and participation patterns among adults in a variety of educational settings. Theories of learning and behavior modification for adults, with implications for adult and continuing education programs. Particular attention given to learners in occupational, adult basic, community junior college, extension and proprietary program settings.

5223 Organization and Administration of Adult Educa- tion. Prerequisites: 5203 and 5213. Organizational procedures and administrative practices for effective planning, implementation and management of adult and continuing education programs. Analyses of legislation, finances and community groups that influence and impact upon adult and continuing education programs.

5233 Needs Analysis. Techniques of conducting organiza- tional analyses of human performance problems, including surveys, interviews, records analysis, group interaction, and task analysis.

5333 Administration and Supervision of Local Occupa- tional Education Programs. The duties of administrative and supervisory personnel responsible for the development, coordination and promotion of occupational education programs.

5340 Special Problems. 1-6 credits, maximum 6. Prerequi- site: consent of instructor. Directed independent study of special topics involving assigned readings, library research, field work or a combination of these.

5443 Interpreting Research in Occupational and Adult Education. Prerequisite: elementary statistics. Seminar on the methods of research, review, synthesis and interpretation with application to particular fields of occupational and adult education.

5480 Modern Technology in Occupational Education. 1-6 credits, maximum 6. Technical developments in specialized occupational areas examined and analyzed for educational curriculum and program implications.

5533 Human Resource Development. Prerequisite: admissi- on to the master's degree program. Introduction to training and development, including history and nature of the field, trainer roles, needs analysis, program development, evaluation, and techniques of conducting training.

5553 Occupational Education for Students with Special Needs. Techniques and procedures by which occupational education may serve individuals with special needs. Field experiences an integral part of the course.

5720* Workshop. 1-3 credits, maximum 10. Professional work- shops of various topics and lengths. Each workshop designed to be either an update or special focus of individual needs concerned with occupational and adult education.

5880 Internship. 3-6 credits, maximum 6. Prerequisite: con- senter of instructor. Supervised experience working in business, industry, human service, or education settings.

5912 Organization and Administration of Adult Basic Edu- cation Programs. Prerequisites: 5203 and 5213. Organizing and directing basic adult education for occupation.

6000* Doctoral Thesis. 2-10 credits, maximum 15. Required of all candidates for the Doctor of Education degree in occupational and adult education.

6103 Philosophy of Occupational and Adult Education. Prerequisites: graduate course in philosophy or philosophy of education. Alternative perspectives for developing a philosophic position in occupational and adult education.

6213 Aging, Learning and Work. Prerequisite: graduate standing. An analysis of the nature of adult learning in the workplace and their relationships to the aging process.

6333 Strategic Planning and Policy Development. Prerequi- sites: 5123, 5223 or 5333, master's degree. Theoretical and practical aspects of the concepts and implementation processes. Anticipation among various public and private sector organizations involved with human resource development.

6533 Critical Issues in Human Resource Development. 3 credits. Prerequisites: 5222 or 5533. Issues of concern to training directors and other resource development (HRD) practitioners are researched, including marketing, consultation, organization, development, productivity, and managing change.

6780 Doctoral Seminar. 1-2 credits, maximum 2. Seminar required for students admitted to the OAED doctoral program. Professional ethics, responsibilities, research expectations, and departmental procedures.

6880 Internship in Occupational and Adult Education. 1-8 credits, maximum 8. Prerequisite: consent of instructor. Directed field experiences related to the participant's area of concentration. Provides opportunities for an individual to put into practice new ideas, theories and concepts learned in graduate study.

OFFICE MANAGEMENT (OFFMG)

3753 Executive Secretarial Transcription. Lab 2. Prereq- uisite: BUSUR 3423 or BUSUR 3523 (or concurrent enrollment). Transcription of executive-level dictation with exacting standards covering English usage, vocabulary, proofreading accuracy and speed of transcrip- tion.

3863 Office Procedures. Prerequisite: BUSUR 2630. Theory of and applied performance in secretarial and managerial operations. Human relations in business as well as decision making and problem solving.

PETROLEUM TECHNOLOGY (PET)

1113 Introduction to Petroleum Industry. Lab 2 Prerequi- site: MATH 1113 or one unit of high school algebra. Exploration, drilling, production, transportation and marketing.

1234 Petroleum Fluid Properties. Lab 2. Prerequisites: MATH 1513 or 1715: CHEM 1215 or 1314. Chemical and physical properties of petroleum, petroleum products, natural gas, coal and drilling fluids. Introduction to reservoir engineering.

2333 Basic Petroleum Production. Lab 2. Prerequisites: 1234; GENT 2323 (pre or corequisite). Operation of oil and gas wells. Design, sizes and selection of production equipment. Performance and interpretation of basic testing connected with oil and gas production. Solutions to routine production problems.


3223 Oil Property Evaluation. Prerequisites: 2333, 3114. Forecasting revenues and expenses associated with petroleum properties. Discounted and nondiscounted measures of investment worth. Decline curve analysis. Oil field deals. Windfall profit and federal income tax considerations. AFE project economics, sensitivity analysis, computer applications. Concludes with a comprehensive lease evaluation project.

3234 Petroleum and Natural Gas Processing Fundamentals. Lab 2. Prerequisites: 2234; MATH 2373; COMSC 2113 (pre or corequisite). Material balances, energy balances, PV diagrams, phase behavior relationships applied to petroleum and natural gas processing.

3454 Petroleum and Natural Gas Unit Operations. Lab 2. Prerequisites: 3234; MATH 2383. Petroleum and natural gas operations are studied qualitatively and quantitatively. Distillation, absorption, dehydration, sweetening, refinery processes, instrumentation and controls.

4008 Advanced Technology Problems. 1-4 hours credit, maximum 6. Prerequisites: junior standing and consent of head of department. Special technical problems in a petroleum area.

4122 Advanced Petroleum Problems. Lab 3. Prerequisites: 4224; senior standing. Individually selected topics in advanced petroleum drilling, production (primary, secondary or tertiary), recovery, transportation and storage.

4224 Petroleum Reservoir Engineering. Lab 3. Prerequisites: 3234; MATH 2383. Petroleum and natural gas operations are studied qualitatively and quantitatively. Distillation, absorption, dehydration, sweetening, refinery processes, instrumentation and controls.


4334 Advanced Petroleum Production. Lab 3. Prerequisites: 2333, 4224, and MECTD 3323. Remedial and worker operations on producing oil and gas wells. Analysis and design of artificial lift techniques. Well testing and problem well evaluation.

PHILOSOPHY (PHILO)

1013 (H)Philosophy of Life. Introductory ethics and social philosophy. Moral decision-making, the good life, social values, freedom and responsibility.

1213 (H)Philosophies of Life. Introductory ethics and social philosophy. Moral decision-making, the good life, social values, freedom and responsibility.

1313 (A)Critical Thinking. Informal and formal reasoning; explicit definitions and fallacies. Emphasis on the critique, evaluation and development of arguments in everyday discourse. Practical applications.

2113 (H)Introduction to Philosophy. Selected philosophical problems: the nature of reality, knowledge, value, social ideals and religion.

3113 (H)Ancient and Medieval Philosophy. Main systems of Western philosophy from the Greeks to 15th Century Europe. Emphasis on Plato, Aristotle, Augustine and Aquinas.

3213 (H)Modern Philosophy. Major philosophers and problems in Western thought from the 16th through the 19th Century. Emphasis on Descartes, Hume and Kant.

3300 (H)Philosophy and the Quality of Life. 1-3 credits, maximum 6. Series of self-paced, one-credit modules dealing with the arguments and values in controversial issues affecting the quality of life of persons and societies.

3413 (H)Ethics. Contemporary and classical views on the nature of moral judgments, moral value, relativity and objectivity, freedom and responsibility.


3583 (H)Philosophical Study of Marxism. Prerequisites: 12 semester credit hours in HIST, POLSC, and/or PHILO. The work of Marx and Engels and of selected later writers such as Kautsky, Lenin, and Gramsci.


3713 (H)Philosophy of Education. Traditional and contemporary American educational theories. Educational conservatism, humanism in education, moral education, vocationalism and radical reform movements.

3803 (H)Moral Issues in Business. Ethical issues in business, such as employer-employee duties and loyalties, advertising uses, preferential treatment practices. Analytic grounding in basic theories of ethics.

3813 (H)Recent American Philosophy. Dominant trends in American philosophy during the last 100 years, with emphasis on pragmatism.

3823 (H)Engineering Ethics. Philosophical analysis of moral issues in engineering practice, such as whistleblowing, conflicts of interest and product liability. Professional codes of ethics.

3833 (H)Ethical Issues in Biology and Medicine. Moral problems brought about by recent developments in scientific research and medical technology. Abortion, euthanasia, genetic engineering, and human experimentation. Same course as REL 3833.

3913 (H)Existentialism. Selected writings and themes in the development of existentialist and related intellectual movements. Subjectivity, phenomenological description, hermeneutics, freedom and value; and such writers as Kierkegaard, Nietzsche, Heidegger, Sartre, Marxel and Buber.

3923 (H)Contemporary Issues in Philosophy. Selected current controversies and recent trends in philosophy.

3943 (H)Oriental Philosophy. Three main streams of Asian thought: Indian, Chinese and Buddhist. How various thinkers in the three traditions have dealt with questions of being and becoming, knowledge, ethics and society.

4013 (H)Perspectives on Death and Dying. Issues that arise as patients move through the effects of terminal illness, dying, patient, the ethical issues of euthanasia and suicide, the process of grief, death in literature and the arts, and philosophical and religious views on immortality. Same course as REL 4013.

4113 (H)Philosophy of Art and Literature. Nature of aesthetic concepts and experiences: form, meaning and values in the arts; the function of art in society; criteria of criticism of the arts.

4203 (A)Principles of Symbolic Logic. Prerequisite: 1313 or consent of instructor. Symbolic analysis and calculus of propositions. Applications in various fields.

4313 (H)Philosophy of Mind. Problems in philosophical psychology, mind and body, freedom and determinism, personal identity and survival, self-knowledge, analysis of mental concepts.

4453 (H)Philosophy in Literature. Selected literary works examined for philosophical ideas and themes. Attention to the interrelation of form and content. Thematic approach.

4613 (H)Scientific Method. Fundamentals of scientific explanation, including nature of evidence, definitions, classification, probability and models.

4713 (H)Philosophy of Science. Philosophical issues related to science and its role in society. Topics include science and common sense, laws and theories, causality, nature of scientific progress.

4990 (A)Special Studies In Philosophy. 1-3 credits, maximum 10. Selected philosophical topics or works.

5000 Thesis in Philosophy. 1-6 credits, maximum 6. Supervised individual work on a thesis for a master’s degree.

5210 Seminar on a Major Philosopher. 3 credits, maximum 9. Prerequisite: three courses in philosophy. The writings of a major philosopher and related material.

5310 (A)Seminar on a Field of Philosophy. 3 credits, maximum 9. Prerequisite: three courses in philosophy. Selected topics in one field of philosophy.


5610 Philosophical Issues in Education. 2-3 credits, maximum 3. Contemporary issues in educational theory and practice. The relation of education to political thought, religion, public law and culture.

5713 Contemporary Philosophies of Education. Analysis of contemporary educational philosophies, with attention to recommended aims, curricula and methods.

5910 Research Problems in Philosophy. 1-3 credits, maximum 10. Prerequisite: three courses in philosophy. Individual or group research on specific philosophical problems.

PHYSICAL EDUCATION (PE)

1753 Introduction to Physical Education. The nature, scope and significance of physical education. Historical and philosophical foundations, major sub-disciplines and their interrelationships, and career opportunities.

1812 Movement Activities I. Theory and practice of selected sport and movement activities such as soccer, golf, volleyball, and aquatics; analysis and practice of respective critical skills in each area; basic rules and strategies.

1822 Movement Activities II. Theory and practice of selected sport and movement activities such as basketball, stunts and tumbling, softball, and archery; analysis and practice of critical skills in each area; basic rules and strategies.

1832 Movement Activities III. Theory and practice of selected sport and movement activities such as track and field; gymnastics apparatus; weight training, and social dance; analysis and practice of critical skills in each area; basic rules and strategies.
PHYSICS (PHYS)

1014 (N)Descriptive Physics. A survey course presenting the basic concepts and principles of physics with a minimum of mathematics. Motion, waves, temperature, electricity, magnetism, optics, atomic structure, and nuclear energy. No credit for students with credit in 1114.

1114 (N,L)General Physics. Lab 2. Prerequisite: high school algebra and trigonometry, or MATH 1715. An algebra-based introductory course covering the basic concepts of physics. Practical examples of the role of physics in other disciplines. Newtonian mechanics, fluids, heat, thermodynamics, waves, sound. No credit for students with credit in 1014.

1112 (N,L)General Physics. Lab 2. Prerequisite: 1114. Continuation of 1114; electricity, magnetism, optics, quantum physics, atomic and nuclear structure.


2413 Electronics. Prerequisite: 2114 or consent of instructor. AC circuits, vacuum tube and transistor amplifiers, oscillators, and power supplies. Pulse and digital circuits.

2520 (L)Electronics Laboratory I. 1-3 credits, maximum 3. Lab 3. Prerequisite: 2413 or concurrent enrollment. Special projects. Construction and testing of circuits studied in 2413.

3013* Mechanics I. Prerequisite: 2114 or equivalent, and MATH 2513 or concurrent enrollment. Mechanics of particles, systems of particles and rigid bodies.

3113 Heat. Prerequisites: 1214 or 2114, and calculus. Thermodynamics, heat transfer, elementary theory of specific heat and the three laws of thermodynamics.

3213 Optics. Prerequisite: 1214 or 2114. Geometrical optics; illumination and photometry; interference, diffraction, dispersion, absorption and polarization of light.

3313 Modern Physics for Engineers. Prerequisite: 2114 or equivalent. Emphasis on nuclear, molecular and solid state physics with engineering applications.

3321 (L)Laboratory I. Lab. 3. Use of lasers, lens systems, spectroscopy, interferometry, interaction of light with matter, thermal physics, and wave propagation.


3522 (L)Radioactivity and Nuclear Physics Laboratory. Lab 6. Prerequisite: 4666 or 4213 or concurrent enrollment. Basic measurement techniques in nuclear physics.

5110 Seminar. 1-3 credits, maximum 6. Prerequisite: graduate standing in physics. Special topics in physics.

5133* Theory of Spectra. Line spectra, hyperfine structure, Lamb shift, band spectra, NMR spectra and ESR spectra.

5213* Statistical Mechanics. Prerequisite: 5113. Maxwell-Boltzmann distribution; partition function and its connec- tions with classical thermodynamics; phase space and the Liouville theorem; Planck's radiation law; quantum statis- tics; ensemble theory; application to real gases, specific heats, paramagnetism, condensation phenomena and Wedemann-Franz law.

5263* Nuclear Physics. Prerequisites: 5453 and 5613. Nuclear forces, structure of nuclei and nuclear models.

5313* Electromagnetic Theory. Prerequisite: 5453. Electric and magnetic fields in free space and in matter. Boundary value problems, Green's functions, stress tensors, multipole expansions, thermodynamics; electromagnetic waves.

5350 Special Problems. 1-3 credits, maximum 3. Prerequis- ite: graduate standing in physics. Special problems of experimental or theoretical nature. Largely individual work with written report required.

5353* Membrane Biophysics and Bioenergetics. Prerequisites: 4423 and BISC 3014 or BIOCH 4113 or CHEM 3354 or PHYS 3313. Application of biophysical, biochemical and biological techniques to the study of the structure and function of membranes and membrane components, kinetic measurements, spectroscopic tech- niques and dextric techniques. Application of these illustrated with current research problems. Same course as ZOOL 5223.

5413 Classical Mechanics. Prerequisites: 3013 and 3413 or equivalent. Generalized coordinates and advanced dynamics; coupled systems, wave motion; theory of elasticity.

5453 Methods of Theoretical Physics. Prerequisite: 3513. Introduction to the various methods and techniques used in theoretical physics.

5513 Selected Topics in Acoustics. Prerequisites: 4423, 5453. Radiation, transmission and absorption of acous- tic waves, acoustic impedance; high-intensity effects; ultrasonics.

5613* Quantum Mechanics I. Prerequisite: 5453. Postulates of quantum mechanics. Operators, commutation rela- tions, eigenfunctions. Schroedinger, Heisenberg and interaction formalisms, angular momentum and central field problems; nondegenerate perturbation theory.

5663* Solid State Physics I. Prerequisite: 4263. Crystal struc- ture, cohesive energy of ionic crystals and metals, specific heats, free electron theory of metals, band the- ory, Brillouin zones, insulators and alloys; magnetic properties, optical properties and thermal and electrical conductivity of solids.

5713* Solid State Physics II. Prerequisite: 5663 or equiva- lent. Symmetry, dielectric properties, ferroelectrics, mag- netic properties, mechanical properties and defects of solids.

5913* Advanced Topics in Astrophysics. Prerequisites: ASTRO 2023 and 3023 desired but not mandatory. Deriva- tion of fundamental equations and application to prob- lems in astronomical spectroscopy, stellar atmospheres, star clusters, interstellar matter and radio astronomy.

5960* Problems in Chemical Physics. 3-6 credits, maximum 9. Prerequisite: consent of instructor. Intermolecular forces; interaction of radiation with matter in bulk form, dielectric properties of matter, polymer physics and quantum theory of biopolymers.

6000* Doctoral Dissertation Research. 1-15 credits, maxi- mum 60. Prerequisite: admission to candidacy and per- mission of major professor.

6010 Advanced Graduate Seminar. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Special topics of advanced nature in physics.

6113* Advanced Theory of Solids. Prerequisite: 5663. Many-body techniques, transport processes, band theoretical techniques, superconductivity, dynamics of electrons in a magnetic field, and alloys.


6313* Quantum Mechanics II. Prerequisite: 5613. Scattering theory, many-particle quantum mechanics and applica- tion to atomic and molecular systems; degenerate and time-dependent perturbation theory.


6613* Advanced Nuclear and Particle Physics. Prerequi- site: 5663. Nuclear and elementary particle interactions, resonances, and models; relativistic quantum mechanics and quantum field theory.


PHYSIOLOGICAL SCIENCE (PHSI)

3113 (L)Physiology of Exercise. Lab. 2. Prerequisite: ZOOL 3301. Physiological effects of exercise.

5000* Research and Thesis. 1-6 credits, maximum 6. Prerequis- ite: consent of instructor. Research problems to meet the requirements of the M.S. degree.

5116* Problems in Physiology. 1-5 credits, maximum 20. Prerequisite: approval of instructor. Investigations in physiology for graduate and advanced undergraduate students. Same course as ZOOL 5110.

5113 Basic Reproductive Physiology. Prerequisite: ZOOL 3204. Female and male reproductive processes, the influence of environmental factors upon these processes and the application of reproductive physiology to animal production. Same course as ANSI 5113.

5116* Veterinary Gross and Developmental Anatomy I. Lab. 7. Prerequisite: first-year standing in the College of Veterinary Medicine or consent of instructor. Embryol- ogy and anatomy of domestic mammals using the dog as the primary model. Emphasis on the integration of developmental gross, radiographic and applied aspects of veterinarian anatomy as they relate to a topographical appreciation of the living individual. Integrated lecture-dissection laboratory format.

5142* Rumen Physiology. Prerequisite: ANSI 3653. Physi- ology and development of the ruminant digestive tract. Same course as ANSI 5742.

6000* Research and Thesis. 1-15 credits, maximum 50. Prerequisite: consent of instructor. Independent research for the doctoral dissertation under the supervision of a graduate faculty member.

6110* Advanced Physiology of Selected Systems. 2-10 credits, maximum 10. Prerequisites: 5125 or ZOOL 4215. Advanced studies in gastrointestinal, cardiovascular, respiratory, excretory and neuroendocrine physiology. Each part of this sequential course may be taken for two hours credit. Student should ascertain the topics before registering for this course a second time. Same course as ZOOL 6110.


6200* Topics in Advanced Pharmacology and Toxicology. 1-4 credits, maximum 15. Prerequisite: consent of instruc- tor. Selected topics in advanced pharmacology and tox- icology such as cardiopulmonary, gastrointestinal or neuroendocrine toxicology; radiation; heavy metal, chemical or plant toxicity or biotechnology. Repeat- able; re-enrollment permits study of additional topics.

622* Advanced Physiology of Reproduction. Lab 3. Prerequisite: 5113 or 5253 or equivalent. Selected aspects of the physiology of reproduction of domestic and laboratory animals; considerations of infertility. Emphasis placed on current literature.

6233 Laboratory in Electron Microscopy. Lab 12. Prerequisite: consent of instructor. Student learns to prepare specimens for and to operate the electron microscope, and techniques for printing and preparation of electron micrographs for publication.

6273 Comparative Neurophysiology. Lab 2. Prerequisite: ZOOL 5263. Physiology of mammalian nervous systems.

6330 Veterinary Neuroanatomy. 1-3 hours credit, maximum 6. Lab 3-9. Gross and microscopic anatomy of the central and peripheral parts of the nervous system of domestic animals, including the special sense organs.

6415 Endocrinology. Lab 6. Prerequisite: ZOOL 4215. Structure, function and interrelationships of the endocrine glands.


6523 VeterinaryAnatomicalProblems. 1-3 hours credit, maximum 12 Lab 3-9. Prerequisite: consent of instructor. Problems in gross, developmental or histologic anatomy.

6564 VeterinaryToxicology. Lab 2. Prerequisite: third-year standing in the College of Veterinary Medicine or consent of instructor. Veterinary toxicological problems and therapeutics. Identification of selected poisonous plants and discussions of their toxicity.

5670 Seminar. 1-6 credits, maximum 6. Consideration of literature and research problems pertaining to physiology and pharmacology.

6701 VeterinaryPhysiologicalScienceTopics. Lab 1. Prerequisite: 404th-year standing in College of Veterinary Medicine. Elective topics in physiological sciences related to veterinary medicine. Course can fulfill one of elective options of fourth-year veterinary medical students.

6720 ComparativeRegionalAnatomy. 1-3 hours credit, maximum 12. Lab 3-9. Comparative study of limited parts or regions of the bodies of animals.


**PLANT PATHOLOGY (PLP)**

3134 Pathogenic Microbiology. Lab 3. Prerequisite: MICRO 2124. Pathogenic bacteria as they relate to humans, other animals, plant and insects. Same course as MICRO 3134.


4013 PlantDiseaseControl. Lab 3. Prerequisite: 3344 or concurrent enrollment. Disease-control theory and practices. Control practices and economics are considered in relation to consent of instructor. Water relations, transport, overflow metabolism and other aspects of catabolism and biosynthesis in the fungi in relation to fungal problems of growth and differentiation, which are unique to some of these fungi. Same as MICRO 5243.

5304 Phytobacteriology. Lab 4. Prerequisite: 3344. Bacteria as plant pathogens, with examination of the taxonomy, genetics, ecology, physiology, host-parasite interaction and control of phytobacteria.

5413 Plant Disease Epidemiology. Lab 3. Prerequisites: 3344 or 5043. Introduction to methodology and technical equipment used in epidemiological research and application of epidemiological principles in plant disease control.

5560 Problems in Plant Pathology. 1-5 credits, maximum 10. Prerequisite: consent of instructor.


5724 Physiology of Host-Pathogen Interactions. Lab 4. Prerequisites: 3344 and BIOCH 3653. Physiology of the interactions between plants and pathogens. Mechanisms by which pathogens infect and by which plants resist infection.

5850 Plant Pathology Seminar. 1 credit maximum per semester. 2 credits for M.S. and 4 credits for Ph.D. required.

5860 Colloquium. 2 credits, maximum 2. Prerequisite: 3344. Concepts and principles of plant pathology through discussions of pertinent literature.

6000 Research. 1-12 credits, maximum 36. Research for the Ph.D. degree.

6102 Genetics of Plant Disease. Lab 4. Prerequisites: 3344 or equivalent and a course in general genetics. Genetics of host plants, plant pathogens and the interaction between the two. Flor’s gene-for-gene hypothesis and its implications in breeding for disease resistance.

6202 Genetics of Fungi. Lab 4. Prerequisites: 5104 or BOT 5104 or equivalent and a general course in genetics. Mating systems, parasexuality, matogenesis, and gene mapping of fungi. Involvement of these topics in plant pathology.

6300 Soilborne Diseases of Plants. Lab 3. Prerequisite: 3344. Soilborne diseases, their reception and importance, the pathogens involved, rhizoplane and rhizosphere influences, inoculum potential, specificity of pathogens, suppressive soil effects and disease management. Lecture and discussion sessions will emphasize in-depth understanding of problems and complexities associated with studies of soilborne pathogens.

6403 Advanced PlantNematology. Lab 4. Prerequisite: 5004. Techniques for, generic and specific identification, morphometric determination, in vitro observation, biological illustration, photomicrography, and specialized manipulations in taxonomy.

**POLITICAL SCIENCE (POLSC)**

1010 Studies in American Government. 1-2 credits, maximum 2. Special study in American government to allow transferring of quarter to semester credit. For advanced, special, and non-plant pathology graduate students.

5004 Myology. Lab 6. A systematic study of the fungi. Same as BOT 5104.

5243 Fungal Metabolism. Prerequisites: one course in biochemistry, consent of instructor. Comparative study of fungal, bacterial, viral, nematode and environmental diseases. For advanced, special, and non-plant pathology graduate students.

5304 Phytophysiology. Lab 4. Prerequisite: 3344. Bacteria as plant pathogens, with examination of the taxonomy, genetics, ecology, physiology, host-parasite interaction and control of phytobacterials.

5413 Plant Disease Epidemiology. Lab 3. Prerequisites: 3344 or 5043. Introduction to methodology and technical equipment used in epidemiological research and application of epidemiological principles in plant disease control.

5560 Problems in Plant Pathology. 1-5 credits, maximum 10. Prerequisite: consent of instructor.


5724 Physiology of Host-Pathogen Interactions. Lab 4. Prerequisites: 3344 and BIOCH 3653. Physiology of the interactions between plants and pathogens. Mechanisms by which pathogens infect and by which plants resist infection.

5850 Plant Pathology Seminar. 1 credit maximum per semester. 2 credits for M.S. and 4 credits for Ph.D. required.

5860 Colloquium. 2 credits, maximum 2. Prerequisite: 3344. Concepts and principles of plant pathology through discussions of pertinent literature.

6000 Research. 1-12 credits, maximum 36. Research for the Ph.D. degree.

6102 Genetics of Plant Disease. Lab 4. Prerequisites: 3344 or equivalent and a course in general genetics. Genetics of host plants, plant pathogens and the interaction between the two. Flor’s gene-for-gene hypothesis and its implications in breeding for disease resistance.

6202 Genetics of Fungi. Lab 4. Prerequisites: 5104 or BOT 5104 or equivalent and a general course in genetics. Mating systems, parasexuality, matogenesis, and gene mapping of fungi. Involvement of these topics in plant pathology.

6300 Soilborne Diseases of Plants. Lab 3. Prerequisite: 3344. Soilborne diseases, their reception and importance, the pathogens involved, rhizoplane and rhizosphere influences, inoculum potential, specificity of pathogens, suppressive soil effects and disease management. Lecture and discussion sessions will emphasize in-depth understanding of problems and complexities associated with studies of soilborne pathogens.

6403 Advanced Plant Nematology. Lab 4. Prerequisite: 5004. Techniques for, generic and specific identification, morphometric determination, in vitro observation, biological illustration, photomicrography, and specialized manipulations in taxonomy.
Political processes and governmental institutions of major European countries.

Expropriation and revolutionary damage.

National law, with emphasis on problems related to International Law.

International Communications and Foreign Policy.

Contemporary trends in the politics of selected South American countries.

* Women in Politics: Changing role of women in American government and politics. Voting behavior, public opinion, women in government and the women’s movement.


Problems of Government, Politics and Public Policy.

Legal Problems of the International Environment.

Power, rules, function and role of international institutions, with emphasis on the United Nations and related agencies.

Legal Problems of the International Environment.

American Constitutional Law: Due Process of Law.

Problems of Government, Politics and Public Policy.

Political processes, governmental institutions and administration in China, Japan and Korea.

Political processes, governments and political institutions of selected African countries.

Analytical problems and politics in the Middle East.

European countries.

Comparative Public Administration. The nature and context of comparative administration. Theories concerning political, social and cultural settings of administration and the study of specific administrative systems.

American Politics.

Significant developments and issues in American politics, including American political behavior and political leadership.

American Political Thought. A survey of the major developments in American political thought from the Colonial period to the present, followed by a topical analysis of important recent theoretical developments in political science.

Natural Resources and Environmental Policy. Current problems and issues in the law, politics and administration of energy, land, water, mineral and other natural resources policy with particular emphasis on relations to environmental policies and law.

Contemporary Political Thought. An analysis of 19th and 20th Century political ideas examining the major ideologies and theoretical innovations of modern times.

Electoral Political Theory. Empirical theories about political behavior with emphasis on post-behavioral developments including social choice and game theory.


American Constitutional Law: The Division of Governmental Powers.

Development of principles of constitutional law by the Supreme Court concerning individual and group rights, with particular emphasis on equal protection of the laws concepts in matters of race, gender, wealth, citizenship, legislative reapportionment and voting rights, government powers and affirmative action programs. Legal research techniques.

American Constitutional Law: The Division of Governmental Powers.

Development of principles of constitutional law by the Supreme Court concerning federalism and separation of powers with particular emphasis on political and doctrinal developments surrounding judicial review, regulation of commerce, taxing and spending and presidential power. Introduction to legal research methods.

American Constitutional Law: Due Process of Law.

Prerequisites: 2023 or 3983 recommended. Development of principles of constitutional law by the Supreme Court concerning individual and group rights, with particular emphasis on equal protection of the laws concepts in matters of race, gender, wealth, citizenship, legislative reapportionment and voting rights, government powers and affirmative action programs. Legal research techniques.

Political Science 217
PSYCHOLOGY (PSYCH)

1113 (S)Introductory Psychology. Principles, theories, vocabulary and applications of the science of psychology.

1123 Introduction to Research and Quantitative Methods In Psychology. Lab 2. Prerequisite: 1113. Survey of psychological research methods. Introduction to quantitative methods.

2313 (S)Psychology and Human Problems. Prerequisite: 1113. Personality dynamics and their application to personal, cultural and vocational experience.

2593 (S)Psychology of Human Sexuality. Prerequisite: 1113. Survey of behavioral, personality and psychophysiological components of human sexuality, with special emphasis on the delineation of facts from sexual myths.

2663 Computer-Assisted Instruction. Lab 1. Prerequisite: 1113. Computer-assisted instruction (CAl) methods and theory surveyed. Learning process and learning technology reviewed within the CAI context. Laboratory activities include use of the microcomputer as an instructional device.


3073 (N)Physiological Psychology. Prerequisite: 1113. Neural bases of human experience and behavior including "split-brain" research, physiology of stress and of medication, and biofeedback and biohormone research.

3113 (N)Comparative Psychology. Prerequisite: 1113. Comparative study of behavior characteristics of selected samples of the animal kingdom from protozoa to man.

4323* The Psychology of Work and Industrial Behavior. Prerequisite: 1113. Experimental literature in area of employee motivation. Techniques useful in measurement of employee attitudes and opinions.

4333 Industrial and Organizational Psychology. Prerequisite: 3113. Behavior in task group and organizational context with emphasis on management, leadership and human relations.

3413 Psychology of Social Behaviors. Lab 1. Prerequisites: 1113, 3213. Contemporary theoretical and methodological issues in social psychology with special emphasis on the social psychology of the experiment and experimentation with the social aspects of human behavior.

3443 (A)Abnormal Psychology. Prerequisites: 1113, and 60 credit hours or 45 hours with GPA of 3.25. Review of major approaches to conceptualizing abnormal behavior including dynamic, social and learning-based theories. Discussion and illustration of the major forms of mental illness such as neuroses, psychoses and character disorders.

3513 Psychology of Learning. Prerequisites: 1113, 3213. Behavior change as a function of experience from relatively simple learning processes such as classical and instrumental conditioning to relatively complex processes such as verbal learning and concept identification.

3583 (D)Developmental Psychology. Prerequisites: 1113, and 60 credit hours or 45 hours with GPA of 3.25. The nature of pertinent studies, causes and theories of human developmental phenomena.

3643 Applied Community Psychology. Prerequisite: 1113. Psychological principles for prevention, intervention and rehabilitation in the community model.

3651 Experience in Applied Community Psychology. Lab 3. Prerequisites: 3643 or concurrent enrollment. A field-experience-based application of psychological principles for prevention, intervention and rehabilitation in the community model.


3743 (S)Social Psychology. Prerequisite: 60 credit hours or 45 hours with GPA of 3.25. Human behavior as affected by social stimuli.

3753 Freudian Psychoanalytic Theories. Prerequisite: consent of instructor. A genetic approach to Freud's system of psychoanalysis as a theory of personality and as an historically important method of psychotherapy.

3772 Careers and Professionalism in Psychology. Lab 1. Prerequisite: psychology major/minor. Current career options in psychology are reviewed and career skills developed. Skills and information that a professional psychologist needs in a work setting stressed.

3823 Cognitive Psychology. Prerequisites: 1113, 2313 or equivalent. Cognitive processes. Thinking, problem solving, visual imagery, attention and memory search. Both theory and application emphasized.

4103 (L)Experimental Psychology. Lab 4. Prerequisites: 1113, 1123, 2313 or equivalent and five additional hours in psychology. Problems, methods and applications of experimental psychology.

3990 Undergraduate Seminar. 1-6 credits, 6 maximum. Prerequisite: consent of instructor. For honors students and other outstanding students. Special topics in psychology.

4123 (S)Psychology of Women. Lab 1. Prerequisite: 1113. Sex differences and the development of sex role behavior as they comprehend the psychological dynamics of developmental and social issues for women.

4133 (S)Psychology of Minorities. Prerequisite: 1113. Personality and behavior engendered by minority group status. Review of pertinent psychological theories and research.

4143 (S)Psychology and Law. Lab 1. The new psychological literature is reviewed with emphasis on the psychological basis of vair dare, eyewitness behavior, courtoom persuasion, and reactions to victims. Laboratory exercises conducted in a courtroom.

4182 Current Issues In Clinical Psychology. Prerequisites: 1113, 3443 and three additional credit hours in psychology. Problems of the individual in contemporary society and various clinical approaches that have been proposed as possible solutions to these problems.

4213 Conflict Resolution. Prerequisite: 1113. Interpersonal conflict studied from psychological perspectives. Types and uses of conflict, and conditions for constructive dispute settlement.

4333*Personality. Prerequisites: 1113, 3443, or 2313, or consent of instructor. Major personality theories and their application to behavioral change, behavioral assessment and research.

4483* Psychology of Parent Behavior. Prerequisite: 1113. Parental techniques are examined in light of the personalities of parents, society's view of children and the American judicial-legal system.

4493 (H)History of Psychology. Prerequisite: 1113. History of psychology as an aspect of European intellectual history. Psychological thought from early philosophical roots to modern conceptions of psychology as a science.

4813 Psychological Testing. Prerequisites: 1113, 1123, 2313. Quantitative aspects of measurement and testing, with emphasis on scaling, standardization, reliability and validity. Basic principles of construction and the ethics of use.

4990 Special Problems. 1-6 credits, 6 maximum. Prerequisites: 1113, 2313 and consent of instructor. For honors students and other outstanding students. Experimental or library research.

5000 Thesis. 1-6 credits, maximum. Required of all graduate students majoring in psychology and writing a thesis.

5054* Proseminar in General Psychology I. Prerequisites: graduate standing in the Department of Psychology and consent of instructor. Major theories, methodologies, and substantive topics in psychology. In addition to topics of current relevance, the historical background of psychology will be explored, and the significance of psychological work will be explored relative to the scientific status of the discipline.

5064* Proseminar in General Psychology II. Prerequisites: 5054, graduate standing in the Department of Psychology and consent of instructor. Continuation of PSYCH 5054.
Principles of Behavior Therapy. Prerequisite: graduate standing in the clinical program of the Department of Psychology or consent of instructor. Principles and procedures of behavior therapy and modification.

Psychopathology. Prerequisite: 15 credit hours of psychology. Graduate standing in the Department of Psychology or consent of instructor. Principles of diagnosis and treatment of major disorders.

Psychology Workshop. 2-6 credits, 6 maximum. Provides an opportunity to study specific psychological problems, both applied and theoretical.

Identity Issues. Prerequisite: six credit hours of psychology and consent of instructor. Social issues related to pluralism with emphasis on community and social psychology.

The Psychology of Substance Abuse. Prerequisite: consent of instructor. Introduction to psychological classification of psychoactive substance (alcohol and drug) use disorders. Theory and research on psychological, biological, and environmental factors that are concomitants of substance abuse. Overview of major research techniques and treatment modalities in this area.

Individual Mental Tests. Prerequisites: 3443, 4813; graduate standing in clinical psychology, counseling psychology, school psychology, or the master's program in psychology; or consent of instructor. Practice in understanding, administering and interpreting the Stanford-Binet, WAIS, WISC-R and other mental tests.

Psychopathology and Treatment. Prerequisites: 3443, 3583 or equivalent; graduate standing in the clinical program of the Department of Psychology, the doctorate program in psychology or the psychometry program, or consent of instructor. Theoretical positions and issues in child psychopathology. Procedures used in the treatment of psychological disorders of children.

Seminar in Human Development. Prerequisite: consent of instructor. Behavioral aspects of development from the prenatal period to senescence. Normal development contrasted to exceptional development.

Personality Theories. Prerequisite: nine credit hours of psychology and consent of instructor. Various theories of personality.

Community Psychology. Prerequisite: consent of instructor. Positive rehabilitative and preventive objectives applied to social welfare problems in community. Problems peculiar to social change and general improvement of the quality of life. Physical, psychological and social factors viewed through system analysis.

Quantitative Methods in Psychology I. Prerequisite: 3213. Statistical methods of evaluating research hypotheses in psychology. Descriptive measures, Student's t, variance designs, correlation and regression techniques, analysis of covariance, with emphasis on applications to psychological experimentation.

Theory and Methods of Scaling. Prerequisites: six credit hours of psychology and three hours in statistics. Theoretical and methodological principles underlying paired comparison, successive interval, fusing, scaling, and equal-appearing interval scales. The application of these measurement scales to research in the behavioral and social sciences.

Psychology of Motivation. Prerequisite: 3914. Outline of theory and research in human and animal motivation.

Research. 1-12 credits, 12 maximum. Prerequisite: consent of instructor. Research project on some psychological problem.

Verbal Processes. Consideration of task and subject variables, transfer and mediation, associative processes and verbal behavior.

Systems of Psychology. Two different meanings of "system" considered: the traditional meaning dealing with the various schools of psychology, and the modern meaning in which contemporary social problems are viewed as sets of interrelated variables that produce unforeseen and remote effects.

Information of Psychology Processing: Development and Aging Aspects. Attention, list processing, pattern recognition and related areas in terms of contemporary facts, theory and application. Special attention paid to development and aging aspects of information processing.

Behavioral Medicine. Prerequisite: graduate standing in the Department of Psychology; consent of instructor. An advanced graduate course for students in training for a Ph.D. in clinical psychology. General considerations for psychophysiological disorders, and intervention strategies in behavioral medicine including biofeedback, and specific consideration and intervention strategies for specific disorders.

Percutaneous Psychology. Prerequisite: 3073 or equivalent. Neurological mechanisms underlying human behavior.

Experimental Learning Theories. Prerequisite: nine credit hours of psychology. Basic concepts and empirical findings in animal and human learning.

Advanced Social Psychology. Prerequisite: 3743. History, theory and experimentation of the development of group membership and individual behavior.

Experimental Social Psychology. Prerequisite: 3743. Social psychology of psychological research with special emphasis on the conceptualization, planning, execution and ethical fulfillment in a laboratory or laboratory-field experience.

Developmental Psychobiology. Prerequisites: 3073 or equivalent; consent of instructor. An exploration of the biological aspects of human development, with particular emphasis on the physiological, ethological, and genetic perspectives.

Seminar in Psychology. 1-9 credits, 9 maximum. Prerequisite: consent of instructor. Consideration of special topics that are particularly timely or technical in nature.

Seminar and Workshop in Test Construction Techniques. Prerequisites: consent of instructor. Organization of test items; development and use of the basic equations and formulas pertaining to the measurement of individual differences on the basis of well-defined collections of stimuli.

Clinical Practicum. 1-12 credits, 17 maximum. Prerequisite: graduate standing in the clinical program of the Department of Psychology, or the doctorate counseling psychology program (marriage and family section). Practicum experience for graduate students in the clinical program of the Department of Psychology who are doing supervised practicum in specific clinical areas of specialization.

Teaching Practicum. 1-2 credits, 2 maximum. Prerequisite: consent of instructor. Primarily for graduate students with well defined new teaching responsibilities.

Projective Psychodiagnostic Methods. Prerequisites: 5113, 5153; graduate standing in the clinical program in the Department of Psychology, or consent of instructor. Administration and interpretation of projective tests such as the Rorschach, TAT, DAP and their derivatives.

Clinical Diagnostic Methods. Prerequisites: 5153, 5173; graduate standing in the clinical program of the Department of Psychology or the doctorate school psychology program, or consent of instructor. Administration and interpretation of diagnostic instruments used specifically with children.

Objective Psychodiagnostic Methods. Prerequisites: 3443, 4813; graduate standing in the clinical program of the Department of Psychology or the doctorate counseling psychology program, or consent of instructor. Restricted to graduate students in programs designed to prepare students for the professional practice of psychology. Complex personality and interest tests and their diagnostic and clinical uses.

Cognitive Processes. Theory and experimental research findings dealing with human thought processes from a developmental and functional standpoint.

Group Processes. Prerequisite: 3743. Analysis of both intragroup and intergroup behavior in small groups. Experimental and research reported. Relationships of small groups to large groups, institutions and collective behavior.

Inpatient Behavioral Management. 1-6 credits, 6 maximum. Prerequisite: enrollment in mental health specialist program (M.S. option). Supervised clinical experience under the direction of a qualified clinical psychologist in a mental health setting.

Dissertation. 1-16 credits, maximum 60. Research and report wherein by graduate students in partial fulfillment of all requirements for the Doctor of Philosophy degree.

Research Design. Prerequisites: 3914, 5323, and doctoral level standing. Experimental techniques in psychophysiology, sensory processes, attention, perception, motivation and emotion, and learning and memory.

Computer Applications in Psychology. Prerequisites: 5303 and 5313. Organization of experimental data for computer-assisted analysis. Emphasis on problems peculiar to within-subject experiments used in psychology, including multiple impacts for behavioral change, including interpersonal, social, community and preventative interventions.

Psychology of Language. Review of data and theories of speech and language behaviors. Laboratory techniques and experimental designs will also be reviewed to emphasize understanding of psycholinguistic research.

Group Treatment Methods. Prerequisites: 5113; graduate standing in the clinical program of the Department of Psychology or consent of instructor. The major approaches to psychotherapy. Methods for creating multiple impacts for behavioral change, including interpersonal, social, community and preventative interventions.

Family Treatment Methods. Prerequisite: graduate standing in the clinical program of the Department of Psychology or the doctorate counseling psychology program, or consent of instructor. Introduction to major techniques of group treatment including Gestalt and transactional analysis as well as more conventional techniques.

Family and Marital Therapy. Prerequisite: graduate standing in the clinical program of the Department of Psychology or the doctorate counseling psychology program. Introduction to techniques and philosophies of family treatment. Includes marital counseling and emphasis on family dynamics.

Advanced Practice in Marital and Family Therapy. Prerequisites: 6523, concurrent enrollment in counseling or clinical psychicum; graduate standing in the clinical program of the Department of Psychology or the doctorate counseling psychology program, introduction to techniques and philosophies of family treatment. Includes marital counseling and emphasis on family dynamics. Corequisite format. Course co-requisite: ABSD 6553.
RELIGIOUS STUDIES (REL)

1103 (H)The Religions of Mankind. Major world religions such as Hinduism, Buddhism, Judaism, Christianity and Islam. A view to understanding the general nature of religion and its various dimensions.

1111 (H)Religion and Contemporary Issues. The nature of religion and its relation to current problems, such as racism, sexism, hunger, ecology and war. 8 weeks only.

2123 (H)Introduction to the Old Testament. The writings of the Hebrew Scriptures with emphasis upon historical background, critical analysis and theological interpretation.


2513 (H)Religious Groups in the United States. Selected religious groups in 19th and 20th-Century America. Emphasis on significant movements and groups outside of mainstream Christianity.


3243 (H)Paul and the Early Church. Recommended: 2223. The letters of Paul in their historical context with special emphasis on his theology and ethics.

3293 History of Christianity. An intellectual and cultural history of Christianity from the second century to the present day. Same course as HIST 3293.

3303 (H)Modern Christian Thought. Important issues for Christianity in the last two centuries: the historical Jesus, the validity of faith, the authority of the Bible and the challenge of modern science.

3403* (H)The Religions of India. Recommended: 1103. The beliefs and practices of Hinduism, Buddhism and Islam in India. Emphasis is placed on the historical origins, scriptures and current developments of each religion.

3413 (H)The Religions of China and Japan. Recommended: 1103. The beliefs and practices of Confucianism, Taoism, Buddhism and Shinto. Emphasis is placed on historical origins and contemporary trends.

3512 (H)The Jewish Tradition. Recommended: 1103 or 2123. An introduction to Judaism, with emphasis placed on the ideas and values emerging from the historical experiences of the Jewish people.

3533 (HJ)The Islamic Tradition. Recommended: 1103. An introduction to Islam, providing an historical survey up to the modern period, with emphasis on the Quran, the prophethood of Muhammad and major aspects of Muslim thought and civilization.


3613 (H)African Cultures and Religion. Key ideas, values and achievements in African culture and tradition as found in literature, art and music viewed in historical and religious perspective.

3623 (H)Religion and the Arts. Key literary, graphic and musical works of art of a historical period will be studied for the religious meaning and the religious context. Emphasis will be placed on interpreting the religious significance. Selected periods will be chosen from the Renaissance to the present.

3713 (H)Religion, Culture and Society. Recommended: 1103, ANTH 2533, SOC 1113. An introduction to the scientific study of religion. Religious activity in both tribal and non-tribal societies is studied in the light of contemporary interpretations of cultural and social behavior. Same course as SOC 3713.

3733* (H,SP)Religion: Psychological Interpretations. Recommended 1103 or PSYCH 2313. A study of the development, theory and research of modern psychological perspectives on the religious experience. Same course as IDS 3733 and PSYCH 3733.

3833* (H)Ethical Issues in Biology and Medicine. Moral problems brought about by recent developments in scientific research and medical technology. Abortion, euthanasia, genetic engineering, and human experimentation. Same course as PHIL 3833.

4013 (H)Perspectives on Death and Dying. Issues that arise as individuals confront the fact of mortality. Dying processes, ethical issues of euthanasia and suicide, the process of grief, death in literature and the arts, and philosophical and religious views on immortality. Same course as PHIL 4013.


4043* (H)Archaeology and Early Christianity. Recommended: 2223. A study of archaeological remains from the Roman world which set a background for early Christian development, including cities, art documents and architecture.

4050* Studies in Religion. 2-6 credits, maximum 6. Independent study, seminars and courses on selected topics in religion.

4101* (H)The World of Islam: Cultural Perspectives. The cultural heritage of the world of Islam explored through its expression in the art, architecture and literature of the Muslim peoples.

4300 Seminar In Biblical Studies. 3 hours credit, maximum 9. Prerequisites: two courses in Biblical studies. Selected topics in the academic study of the Bible.

4333 Contemporary Global Issues in Religious Perspectives. Contemporary issues such as international development, global conflict, poverty, etc. seen in the light of religious and cultural values in international context.

4440* Seminar in Religion and Culture. 3-6 credits, maximum 6. Selected topics on the relationship between religion and culture, as reflected in art, literature, music, journalism, philosophy, the life sciences, or the social sciences.

4613* (H)History of Culture in India. Literature and the arts of India and Pakistan studied in their historical and philosophical context. Same course as HIST 4613.

RUSSIAN (RUSS)

1115 *(I)Elementary Russian I. Lab 1 1/2. Understanding, speaking, reading and writing. Method of instruction is audio-lingual.

1225 *(I)Elementary Russian II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1115.

2113 *(H)Intermediate Russian I. Prerequisite: 1225 or equivalent. Continuation of 1225. Russian grammar, composition and conversation.

2225 *(H)Intermediate Russian II. Prerequisite: 2115 or equivalent. Continuation of 2115.

3003 *(I)The Soviet Union: History, Society and Culture. A comprehensive view of the Soviet Union, stressing those issues in the political, economic, technological, geographical and cultural situation. Accessible to beginning undergraduates. Same course as HIST 3003 and POLSC 3003.

3013 *(I)Russian for Reading Knowledge I. Grammar and vocabulary designed for the student who wishes to be able to read Russian. Translation practice.

3023 *(I)Russian for Reading Knowledge II. Prerequisite: 3013 or equivalent. Practice at reading and translating Russian.

3113 Advanced Russian I. Prerequisite: 2225. Advanced study of reading, writing, and speaking skills in Russian language, combined with reading and discussion of literary and other texts in Russian. Conducted in Russian.

3123 *(H)Russian Culture and Civilization. Art, literature, music, architecture, and contemporary life of Russia Course taught in English.

3223 Advanced Russian II. Prerequisite: 2225. Advanced study of reading, writing, and speaking skills in Russian language, combined with reading and discussion of literary and other texts in Russian. Conducted in Russian. May be taken before Russ 3113.

4113 *(H)Russian Literature in Translation I. Russian literature from its beginning to mid-19th Century: Pushkin, Lermontov, Goncharov, Gogol, Turgenev and Dostoevsky. Readings in English, Classes conducted in English.

4123 *(H)Russian Literature in Translation II. Russian and Soviet literature from mid-19th Century to present: Tolstoy, Chekhov, Gorky, Zamatin, Sholokhov, Pasternak, Bunin, Solzhenitsyn, Arzhan (Daniele), Tertz (Sinyavsky), Voznesensky and Evdushenko. Readings in English, Classes conducted in English.

SOCIOLGY (SOC)

1113 *(S)Introductory Sociology. The science of human society. Emphasis on basic concepts. Assists the student in understanding the social influences on day-to-day life.

1123 *(S,SP)Social Issues and Human Values. Social issues discussed and debated. Oral and written expression of views encouraged on a variety of social issues ranging from racism to the role of the police in the modern industrial state. Course draws on many of the social sciences, with major emphasis being in sociology.
2123 [S]Social Problems. Exploration in selected social issues in contemporary American society, such as deviance, poverty, sexism, racism and ageism.

2223 Rural Sociology. Life in rural America and nonwestern societies examined with special emphasis on social relations, population movement, social change and problems of rural society.


3113 Theoretical Thinking in Sociology. Prerequisite: 6 credit hours of Sociology, including 1113. Sociological theory in three broad areas: the emergence of social theory, the major schools of social theory and the relevance of theory to sociological research.

3223 (S)Social Psychology. Social basis of personality development and behavior, including symbolic environment, self and group, motivation, attitudes and opinions, and social roles.

3323 Collective Behavior and Social Movements. Analyzes panic, crazes, riots and social movements emphasizing institutional and social psychological origins and consequences.

3373 The Sociology of Developing Societies. Prerequisite: one year in sociology or consent of instructor. Theories and practice of development in the Third World since World War II. Emphasis on plans, programs and projects of various national and international agencies and the effects on the culture, social relations, and social structures of Third World countries.

3423 (S)Urban Sociology. Urbanization as a worldwide process. The demographic and ecology of cities and metropolitan regions. Urban planning and future development.


3713 (H)Religion, Culture and Society. Recommended: 1113 and 2353. An introduction to the scientific study of religion. Religious activity in both tribal and technological societies studied in the light of contemporary interpretations of culture and of social behavior. Same course as REL 3713.

3723 Sociology of American Family. Relationship between the family and other American institutional structures. Specific attention to values and behavior in mate selection, sexual behavior, marital relationships and sexual role differentiation.

3823* (S)Sociology of Death and Dying. Death and dying as social phenomena including cross-cultural perspective. An understanding of occupations and professions dealing with terminal patients in hospitals and with funeral directors. Students required to engage in original research from community sources.

3833* The Field of Social Work. Prerequisites: 1113 and 2123. Methods of social work practice, agency setting and current social welfare programs.

3952 Orientation to the Internship in Sociology. Prerequisite: sociology majors or consent of instructor or adviser. Preparation for internship in sociology.

3993 (S)Sociology of Aging. Sociological problems of aging, including the analysis of the behavior of the aged within the framework of social institutions.

4003 Senior Thesis in Sociology. Prerequisites: 3113, 4013, 4133, STAT 4013, and consent of instructor. Conduct a research project (review literature, prepare proposal, gather and analyze data and report results) on a sociologically significant topic or issue.

4013* Qualitative and Applied Social Research Methods. Prerequisites: 3113 and STAT 4013. Conducting, analyzing, reporting and interpreting research; design, data collection, analysis and write-up of evaluation research and social impact assessments. Individual research project included.

4023* Juvenile Corrections and Treatment Strategies. Prerequisite: 3523 or 4333. The juvenile justice system, emphasizing the juvenile court, diversion and youth service bureaus as well as the more traditional training schools and foster homes. Experimental treatment strategies with institutionalized delinquents.

4133* (L)Quantitative Methods in Social Research. Prerequisites: 3133 and STAT 4013. Applying sociological theory to designing research; testing hypotheses by statistical techniques such as sampling, scaling, use of documents and survey instruments. Applying research data to personal decision making and public policy questions. A research project is included.

4213* (S)Sociology of Human Sexuality. Prerequisite: junior standing or consent of instructor. Sociological and social psychological aspects of human sexual behavior, attitudes, and organizations. Theoretical concepts, empirical research, and descriptive rates of behavior are discussed.


4343* (S)Medical Sociology. Health and illness as social and societal phenomena including the doctor-patient relationship, distribution and etiology of disease, the social meaning of health and illness, basic epidemiology, and the sociological processes involved in medical practice. Cross-cultural comparisons and the sociology of the health professions.

4383* Social Stratification. Systems of class and caste, with special attention to the United States. Status, occupation income and other elements in stratification.

4423 Community Organization and Development. Structure, change and development of the local community in rapidly changing society. Emphasis on community organization and planned change.

4433* (S)Social Ecology and Life Processes. Human interdependencies and interrelationships with the social and physical environments, with special focus on the mutual impact of human values, human environment and life processes.

4443* Sociology of Law and Legal Institutions. Prerequisite: 3523 or 4333. Criminal and civil law as mechanisms of social control; conflict and consensus models of legislation; legality doctrine and its application by police, prosecution and defense, and administrative agencies of control. Decision processes in the criminal justice system, personnel and case loads and related areas.

4513* Demography of Minorities. Compares several minority groups along major demographic dimensions, i.e., a comparison across minority groups as well as within minority groups. Emphasizes social, political and economic factors as affected by population variables.

4533* (S)World Population Problems. Fertility, mortality and migration, and other factors related to population size, density, and composition; the population explosion, worldwide famine, birth control, and other serious social issues.

4623* (S)Sociology of Industry and Work. The relationship of the social order and work plant as a social system, work role behavior and special groups in industry and work.

4643 ([)]Women: A Cross-cultural Perspective. Compares the lives of women in different types of societies (hunting and gathering, horticultural, peasant and agricultural). Social, familial, economic and legal status of women in American society. Same course as ANTH 4643.

4773* Social Casework Methods. Prerequisite: 3883 or consent of instructor. Methods for social work intervention with individuals, groups and families. Concepts, techniques and assessment methods.

4923* The Field of Corrections. An overview of correctional work focusing on probation, parole and institutions. A survey of contemporary alternatives to conventional imprisonment.


4990 Exploration of Sociological Issues. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Examines sociologically significant topics and issues.

5000* Thesis in Sociology. 1-6 credits, maximum 6.

5113 Sociological Theory I. Prerequisite: 3113 or equivalent. Major trends in sociological thought, 1800-1920. The emergence of sociological theory in Europe and America.

5213 Methods of Demography. Prerequisite: STAT 4013. Introduces the student to methods of collecting and analyzing data in the field of demography. Empphasizes population analysis utilizing the three basic variables: birth, death and migration and the attendant statistical mathematical applications.

5243 Social Research Design and Analysis. Techniques in design, data collection, analysis and interpretation of data for qualitative and quantitative sociological research.

5253 Sociology of Small Groups. Prerequisite: 3223 or equivalent. Structural variation, ordering, communication, social bonding and task performance in small-group association.

5263* Methods of Social Research II. Prerequisite: 4133 and STAT 4013, or equivalents. Advanced techniques in sociological research and data analysis focusing on the formulation of substantive research questions and application of a variety of statistical techniques and computer programs to answer such questions.

5323* Social and Cultural Change. Classical and modern theories of social, cultural and societal change. Particular emphasis on societal development in the modern world system and its impact on individuals and social relationships.

5353 Social Systems Analysis. Relations between properties of relatively large social systems. Emphasis on theoretical and empirical derivations of their measures and research concerning their interrelations.

5533* Correctional Institutions and Residential Treatment. Prerequisite: 4923 or equivalent. Nature and effects of custodial institutions on the inmates. Prison community, its structure, social processes and dynamics. Resocialization of prison inmates in new vocational and social skills.

5563 Community Treatment of Offenders. Prerequisite: 4923 or equivalent. Treatment of offenders in the community without incarcerating them in prisons. Probation, parole and other rehabilitative services. Impact of new community treatment centers, group homes, probation hotels and halfway houses. Effectiveness of the individual, group and family therapies on the offenders.
SPEECH COMMUNICATION (SPCH)

2713 (S,Sp) Introduction to Speech Communication. Principles and techniques of preparing for, participating in and evaluating communication behavior in the conversation, the interview, group discussion and the public address. A competency-based approach

3010 Speech Activity Participation. 1-3 credits, maximum 6. Preparation for and participation in speech communication and/or speech pathology activities.

3923* Elements of Discussion. The nature of small groups. Emphasis upon task groups with special consideration given to group roles, group norms, group leadership and effective participation in various types of discussion groups.

3711 Employment Interviewing. Lab 1. Prerequisite: junior standing, requires student to understand, prepare for, and participate in employment interviews. Resumes, researching job opportunities and other forms of preparation for an interview.

3713 Argumentation and Debate. Prerequisite: 2713. The responsibilities of the advocate, the proposition, evidence, reasoning, the case, fallacies and rebuttal. Experience in mini-debates, standard and cross-examination debating.

3723* Business and Professional Communication. Prerequisite: 2710. Items encountered in business and professional settings. Effective listening, business-organizational communication barriers and corrective strategies, interviewing, nonverbal business communication, parliamentary procedures and group setting, special forms of public speaking along with techniques of oral reporting and briefing.

3733* Elements of Persuasion. Prerequisite: 2713. Principles and concepts relevant to interpersonal and public persuasive encounters. The instrumental nature of persuasion, audience analysis and the ethics of persuasion. Designing and participating in actual persuasive encounters.

3743 Advanced Public Speaking. Prerequisite: 2713. The preparation and delivery of various types of public speeches.

3793 Processes of Interviewing and Speech Communication. Prerequisite: 2713. Principles and techniques of interviewing are considered along with specific guidelines for the interviewer in survey, journalistic, counseling, selection, appraisal, legal, medical, and sales interviews.

4010* Research and Practicum. 1-3 credits, maximum 9. Prerequisites: consent of Instructor; prospectus should be filed during semester previous to enrollment. Supervised research and/or practicum in one of the following branches: theatre, speech communication, speech education, speech correction and audiology.

4073 Speech Communication Models. Prerequisite: senior standing or consent of instructor. A study of the structures and functions of speech-bound communication models.

4723* (H) History of Public Address. Leading world orators and their oratory. Content, style and delivery of their speeches and the historical situation in which they were given.

4743* Problems of Interpersonal Speech Communication. Prerequisite: 3793. Application of modern communication theory to problems of interpersonal communication. Identification and elimination of barriers to communication and the personal interview and small group setting. Use of role-playing techniques and off-campus projects.

4753* (H) Intercultural Communication. Study of speech communication problems within today's socio-cultural context. Emphasis upon social and cultural barriers to communication.

4763* Organizational Communication. Prerequisite: 3793. The interface between communication theory and organizational structure. Nature of communication prob-

SPANISH (SPAN)

1115 (I) Elementary Spanish I. Lab 11 1/2. Pronunciation, conversation, grammar and reading.

1225 (I) Elementary Spanish II. Lab 11/2. Prerequisite: 1115, or equivalent.

2112 (H) Intermediate Reading and Conversation I. Lab I. Prerequisite: 1225 or equivalent. (May have been gained in high school.) Reading and discussion of simplified Spanish texts, mostly cultural. May be taken concurrently with other 2000-level Spanish courses.

2113 (H) Intermediate Conversation and Composition I. Lab I. Prerequisite: 1225 or equivalent. May have been gained in high school.) Review and further presentation of grammar and pronunciation; consolidation of basic skills, with additional emphasis on writing. May be taken concurrently with other 2000-level Spanish courses.

2222 (H) Intermediate Conversation and Composition II. Lab I. Prerequisite: 2113 or equivalent. (May have been gained in high school.) Readings, vocabulary building, conversation, guided composition. May be taken concurrently with other 2000-level Spanish courses.

2223 (H) Intermediate Reading and Conversation II. Lab I. Prerequisite: 2112 or equivalent. (May have been gained in high school.) Reading and discussion of more advanced Spanish texts, mostly literary, may be taken concurrently with other 2000-level Spanish courses.

3003 Survey of Spanish Literature. Prerequisite: 20 credit hours of Spanish or equivalent. Development of Spanish and Spanish-American literature to the present. Class conducted in Spanish.

3210 (I) Advanced Conversation and Composition. 1-3 credits, maximum 3. Lab 6-9. Prerequisite: 20 credit hours of Spanish or equivalent. Practice in composition and discussions, designed to bring students up to a high level of proficiency in speaking and in writing. Spanish majors must take all three credits in one semester.

3211 (I) Advanced Grammar. 1-3 credits, maximum 3. Prerequisites: 20 credit hours of Spanish or equivalent proficiency. Spanish majors must take all three credits one semester.

3333 (H) Hispanic Civilization I. Prerequisite: 20 credit hours of Spanish or equivalent. Reading and discussion of selected texts outlining the development of contemporary Spanish civilization. Classes conducted in Spanish.

3463 (I) Advanced Diction and Phonetics. Lab 1. Prerequisite: 20 credit hours of Spanish or consent of instructor. Required course for teacher certification/licensure. Studies and practice in phonetics and pronunciation. Spanish speech sounds and intonation patterns, with practice to improve the student's pronunciation.

4113 (H) Mexican Literature and Civilization. Prerequisites: 20 credit hours of Spanish or equivalent competence. Reading, analysis, and discussion of the most outstanding Mexican literature produced since 1848. Contemporary works are emphasized. Classes conducted in Spanish.

4173 (H) Hispanic Drama. Prerequisite: 20 credit hours of Spanish or equivalent competence. Reading and interpretation of dramatic works selected from the Hispanic literatures.

4223 (I) 20th Century Hispanic Literature. 1-3 credits, maximum 3. Prerequisite: 20 credit hours of Spanish or equivalent. Major 20th Century Hispanic writers. Classes conducted in Spanish.

4243 (I) Translation and Writing of Documents. Prerequisite: 20 credit hours of Spanish or equivalent competence. Translation of documents produced by government agencies, to bring students up to a business level. Classes conducted in Spanish.

4253 (H) Masterpieces of Hispanic Literature I. Prerequisite: 20 credit hours of Spanish or equivalent competence. Classes conducted in Spanish.

4263 (H) Masterpieces of Hispanic Literature II. Prerequisite: 20 credit hours of Spanish or equivalent competence. Classes conducted in Spanish.

4333 (H) Hispanic Civilization II. Prerequisite: 20 credit hours of Spanish or equivalent. Reading and discussion of selected texts outlining the development of contemporary Hispanic civilization outside the Iberian peninsula. Classes conducted in Spanish.

4563 (I) Seminar in Spanish. 1-3 credits, maximum 9. Prerequisite: 20 credit hours of Spanish or equivalent. Readings and discussion of vital subjects in Spanish.

5110 Advanced Hispanic Studies. 1-3 credits, maximum 9. Lab TBA. Prerequisite: 22 hours of Spanish or graduate standing in foreign language.

Complex Organizations. Prerequisite: six hours of undergraduate sociology or equivalent. Nature and types of complex organizations; organizational structure; organizations and society; organizational changes.

Sociology of Education. Manner in which social forces and institutions influence education and the educational system in the United States.

Internship. 1-6 credits, maximum 6. Supervised field placement.

Advanced Problems and Issues in Sociology. 1-6 credits, maximum 6. Critical examination of significant theoretical formulations. 1920 to the present. Relation between theoretical development and current research emphasis.

The Sociology of Knowledge. Prerequisite: six hours of undergraduate sociology or equivalent. Relationship between human thought and the social context within which it arises.

Seminar in Current Research Literature. 2-3 credits, maximum 6. Methodological analysis of advanced research in major areas of sociology.

Seminar in the Family. 2-3 credits, maximum 6. Intensive analysis of published research in the sociology of the family.

Seminar in Urban Sociology. 2-6 credits, maximum 6. Theoretical and applied approach to cross-cultural urban studies. Examines different methodologies for organizing community analysis.

Seminar in Industrial Sociology. 2-3 credits, maximum 6. Intensive analysis of selected problems in industrial sociology.

Seminar in Social Organization. 2-3 credits, maximum 6. Research and literature relating to macro-sociological analysis.

Seminar in Social Psychology. 2-3 credits, maximum 6. Development and critical analysis of research in social psychology.

Seminar in Deviance and Criminology. 2-3 credits, maximum 6. Current research and theory in criminology, penology and deviance in modern society.

Seminar in Social Gerontology. 2-3 credits, maximum 6. A theoretical and practical examination of the sociology of aging, both individual and societal, of an aging population.

Dissertation. 1-12 credits, maximum 18.

lems in organizations, strategies for overcoming such problems and the development of organizational communication in decision making in organizations.

Diagnostic measures for identifying communicative handicapped child. 5224 Speech and Language Development. Prerequisite: 2113, 2123. The nature, theories and influencing factors of speech and language development.

Clinical Practicum. 1-3 credits, maximum 9. Prerequisites: senior standing in major, 2.75 GPA in major, and consent of instructor. Clinical procedures and supervised practicum in speech and language pathology and audiology.

Aural Rehabilitation for the Acoustically Handicapped. Prerequisite: 3123. Clinical aspects of habilitation and/or rehabilitation programs for deaf and hard-of-hearing, including: speech reading, auditory training, speech conservation, speech and language therapy, hearing aid orientation and counseling. Amplification units studied.

Anatomy and Physiology of the Speech Mechanism. Prerequisite: 2113. Structure and function of the speech mechanism. Laboratory experiences.

Prerequisites: 2113 (previous or concurrent enrollment) and 2213 (preparatory standing). Research methods with emphasis on those used most frequently in speech and language disorders. Direct therapy observations.

Phonetica. Prerequisite: sophomore standing. The normal development of speech and language. The nature, causes and symptoms of communication disorders. Instruction in identification, referral and classroom management of the communicatively handicapped child.

Clinical Practicum. 1-3 credits, maximum 9. Prerequisites: senior standing in major, 2.75 GPA in major, and consent of instructor. Clinical procedures and supervised practicum in speech and language pathology and audiology.

Clinical Practicum. 1-3 credits, maximum 9. Prerequisites: senior standing in major, 2.75 GPA in major, and consent of instructor. Clinical procedures and supervised practicum in speech and language pathology and audiology.

Aural Rehabilitation for the Acoustically Handicapped. Prerequisite: 3123. Clinical aspects of habilitation and/or rehabilitation programs for deaf and hard-of-hearing, including: speech reading, auditory training, speech conservation, speech and language therapy, hearing aid orientation and counseling. Amplification units studied.

Anatomy and Physiology of the Speech Mechanism. Prerequisite: 2113. Structure and function of the speech mechanism. Laboratory experiences.

Prerequisites: 2113 (previous or concurrent enrollment) and 2213 (preparatory standing). Research methods with emphasis on those used most frequently in speech and language disorders. Direct therapy observations.

Prerequisites: 2113 (previous or concurrent enrollment) and 2213 (preparatory standing). Research methods with emphasis on those used most frequently in speech and language disorders. Direct therapy observations.

Prerequisites: 2113 (previous or concurrent enrollment) and 2213 (preparatory standing). Research methods with emphasis on those used most frequently in speech and language disorders. Direct therapy observations.

Prerequisites: 2113 (previous or concurrent enrollment) and 2213 (preparatory standing). Research methods with emphasis on those used most frequently in speech and language disorders. Direct therapy observations.

Prerequisites: 2113 (previous or concurrent enrollment) and 2213 (preparatory standing). Research methods with emphasis on those used most frequently in speech and language disorders. Direct therapy observations.
503 Statistical Methods for Engineers. Lab 2. Prerequisite: 4033. Methods of experimental statistics for engineers. Analysis of variance, multiple comparison test. 2n factorial arrangement of treatments, fractional factorials, randomized block designs, simple and multiple linear regression. No credit for students with credit in 4013 or 5013.

4091 Statistical Analysis System. Prerequisite: 4013 or equivalent. SAS dataset construction, elementary statistical analysis, and use of statistics and graphics procedures available in the SAS package.

4113 Introduction to Probability Theory. Prerequisite: MATH 2365 and one other course in MATH which has either 2265 or 2365 as a prerequisite. Basic probability theory, random variables, moments, functions of random variables, weak laws of large numbers, central limit theorems.

2403 Mathematical Statistics I. Prerequisite: MATH 2365. Introduction to probability theory for students who are not graduate majors in statistics or mathematics. Probability, independence and dependence, random variables, univariate distributions, multivariate distributions, moments, functions of random variables, moment generating functions.

2413 Mathematical Statistics II. Prerequisites: 2403 and MATH 3013. Statistical inference for students who are not graduate majors in statistics or mathematics. Sampling distributions, maximum likelihood methods, point and interval estimation, hypothesis testing.

4223 Introduction to Statistical Inference. Prerequisites: 41 13 and MATH 3013. Basic statistics, bias, probability, probability distributions, fundamentals of statistical inference, hypothesis testing, regression, one-way classification, analysis of variance, comparative analysis, mean model identities. Building linear models from data.

3000 Research in Statistics. 1-6 credits, maximum 6. Methods of research and supervised thesis or report.

5013 Statistics for Experimenters I. Prerequisites: graduate standing and MATH 1513. Introductory statistics course for graduate students. Descriptive statistics, basic probability, probability distributions, fundamentals of statistical inference, hypothesis testing, regression, one-way classification, analysis of variance, comparative analysis, mean model identities. Building linear models from data.

5033 Theory of Linear Models II. Prerequisite: 5233 or 5023 or consent of instructor. Advanced regression topics; mean model theory and application to fixed models; orthogonal polynomials; data structures, observational and sum of squares identities, mean square computations; correlation and linear models from data structures, parameterizations and reparameterization, conventional linear model theory, variance components, computing techniques.

4063 Multivariate Methods. Prerequisites: 4043 and 4023 or 403 1 or 5023. Use of Hotelling's T-squared statistic, multivariate analysis of variance, canonical correlation, principal components, factor analysis and linear discriminant functions.

5113 Intermediate Probability Theory. Prerequisites: 4113 and MATH 4363. Measure theoretical presentation of probability, integration and expectation, product spaces and independence, conditioning, different kinds of convergence in probability theory and statistical spaces. Same course as MATH 5113.

5133 Stochastic Processes. Prerequisites: 4113 and MATH 2613. Definition of a stochastic process, probability structure, mean and covariance function, the set of sample functions, stationary processes and their spectral analyses, renewal processes, counting processes, discrete and continuous Markov chains, birth and death processes, exponential model, queueing theory. Same course as INDS 513 1 and MATH 513 2.

5203 Large Sample Inference. Prerequisites: 4223 and 5113. Different types of convergence in probability theory, central limit theorems, consistency, large sample estimation and tests of hypotheses, concepts of asymptotic efficiency, nonparametric tests.

5213 Bayesian Decision Theory. Prerequisites: 4223 and MATH 4863. Statistical space, decision space, loss and risk, minimum risk decisions, conjugate families of distributions, Bayesian decisions.

5303 Experimental Design. Prerequisite: 5203 or 4203 with consent of instructor or 4053 with consent of instructor. Review of basic concepts and principles of comparative experiments, blocking, randomization in experiments, interpretation of effects and interactions in multiple designs, error term selection principles, multiple comparisons, split-unit experiments, incomplete block designs, confounding of factorial effects in 2n and 3n series of factorials, single and fractional replication optimum seeking designs, pooling of experiments over time and space, crossover and switch back designs.

5323 Theory of Linear Models I. Prerequisites: 4233, and MATH 3013, and one of 4023, 4053 or 5023. Multivariate normal distributions, general linear ear models, Markov theorem, variance components, general linear hypotheses of full rank models.

5333 Theory of Linear Models II. Prerequisite: 5233 or 5023 or consent of instructor. Advanced regression topics; mean model theory and application to fixed models; orthogonal polynomials; data structures, observational and sum of squares identities, mean square computations; correlation and linear models from data structures, parameterizations and reparameterization, conventional linear model theory, variance components, computing techniques.

5403 Theory of Sample Design. Prerequisite: 41 13 or 4023. Deriving estimates and variances of estimates for differ- ent sampling designs. Mathematical development of sampling. Consideration of simple probability sampling including simple random, stratified random, cluster and multisample design. Estimation techniques including ratio and regression estimates. Determination of sample sizes and allocations.


5910 Seminar in Statistics. 1-6 credits, maximum 12. Special topics for master's students. Survey and discussion of research in mathematical statistics and statistical methods.

6000 Research and Thesis. 2-10 credits, maximum 24. Prerequisite: consent of advisory committee. Directed research culminating in the Ph.D. thesis.

6013 Genetic Statistics. Prerequisites: 4213 or 4223, and ANS 6003; or consent of instructor. Linear models for quantitative traits, genetic relationship and linkage. Theory of selection and crossingbreeding. Mathematical techniques in inbreeding. Path coefficient theory.


6213 Advanced Statistical Inference. Prerequisites: 5113, and 5023 or 503 1. Point estimation, maximum likelihood, Cramer-Rao inequality, confidence intervals, Neyman-Pearson theory of testing hypothesis and power of test.

5083 Advanced Design of Experiments. Prerequisite: 5303 and 5233 or consent of instructor. Construction of various experimental designs, such as mutually orthogonal squares, balanced and partial balanced incomplete block designs, confounded and fractionally replicated designs. Response surface methodology. Theory of experiments with unequal replication. Conditioning of factorial effects. Fractional replication of factorials, confounding in mixed series of factorials, randomization tests, transformations of data, plot techniques and principles of split-plot techniques. Analysis of series of experiments and analysis of covariance.

6910 Special Problems. 1-6 credits, maximum 12. Investigation of special problems in the theory and application of statistics using current techniques. Special studies for Ph.D. level students.

TECHNICAL EDUCATION (TECED)

3103 Introduction to Technical Education. Prerequisite: OAE 3113. The role and function of technical education in the development of human resources. Historic and philosophic bases for technical education with emphasis on programs, purposes, and objectives and the variety of environments in which such programs exist.

4112 Institutional Aids. Materials and hardware currently available in typical vocational and technical education programs. Practice in the development of projected and nonprojected materials. Each student develops instructional aids appropriate for use in the technical specialty.

5113 Comparative Occupational Education. Prerequisite: graduate standing. Ideas, practices and systems of occupational education and the comparison of contemporary practices in the United States to provide a basis for an enlarged, critical view of technical education.

5223 Curriculum Development in Technical Education. The interrelationship of mathematics, science, technical specialty and general education in technical curriculums. Contemporary practices in constructing, revising and evaluating technical curriculums.

5233 Occupational Analysis. Techniques for determining educational requirements of technical occupations. Analysis systems used by educational institutions, the military and the United States Department of Labor.

THEATER (TH)

1000 Theater Practicum. Lab 2. Prerequisite: credit, maximum 6. Laboratory experience in theater production; acting and/or crew assignments Graded on pass-fail basis.

2134 Voice and Diction. Freeing the natural voice, development of proper breathing techniques, resonance, and range; use of International Phonetic Alphabet in developing articulation and pronunciation; exercises in phrasing and intonation; preliminary dialect work.

2413 Introduction to the Theater in Western Civilization. Character, plot, thematic, historical and production analyses of various types of play; scripts; understanding the work of various theater artists; developing apprecia- tive audiences.
2423 Oral Interpretation. Reading aloud effectively; training in voice improvement, platform techniques, selection criteria and audience analysis.

2453 Acting I. Prerequisite: 2413. Ensemble techniques and creative improvisation; vocal and physical development for the actor; theories and techniques of acting; fundamental scene and character analysis; scene performance workshops.

2613 Technical Production I. Lab 4. Elementary techniques of stagecraft, lighting and costume for the stage. Emphasis on basic skills. Practical experience preparing for departmental productions.

2623 Technical Production II. Lab 4. Prerequisite: 2613. Intermediate course in stagecraft, stage and craft lighting. Refinement of basic technical skills, introduction of design and conceptualization principles. Practical experience preparing for departmental productions.

3010 Upper-Division Projects. 1-3 credits, maximum 6. Prerequisites: 60 credit hours and consent of instructor. Individual or group study of techniques, history, or literature of the theater. Required written survey of the project and self-evaluation of its results, or a term paper.

3453 Acting II. Prerequisite: 2453. Continuation and refinement of Acting I. Emphasis on textual and character analysis, characterization and inner technique. Stanislavskian acting method explored through workshops utilizing scenes from classic realistic plays, including those of Ibsen, Strindberg and Chekov.


3883 Stage Movement for Actors. Techniques and exercises to build the actor's awareness and abilities for use of the bodily instrument on stage; preparation and readiness for stage; rhythm, posture, and movement patterns appropriate to various styles of theater and to specific character roles.

4413 Lighting for Theater and Television. Lab 2. Stage lighting design, elementary electricity, design of lighting instruments. Practical experience in lighting in preparing for productions.

4420 Summer Theater. 3-6 credits, maximum 6. Workshop in all phases of theater production: acting, stagecraft, lighting, makeup. publicity, box office, etc.

4433 Scene Design for Theater and Television. Prerequisites: 2413 and 2623. The designer's approach to the script; execution of sketches, models and working drawings.

4443 Directing. Prerequisite: 2453. Emphasizes play analysis for production, problems in staging, and the role of the director. Planning and direction of scenes in laboratory situations.

4453 (H)Theater History I. Aesthetic and social relationships of theater and western civilization from primitive times to the mid-17th century.

4463 (H)Theater History II. Aesthetic and social relationships of theater and western civilization from the mid-17th century through the 19th century.

4473 Theater History III. Aesthetic and social relationships of theater and western civilization from 1900 to the present.

4523* Readers Theater. Innovative approaches to presentation of alternate forms of literature for the stage.

4723 Stage Costume History II. Lab 2. Comprehensive history of theatrical costume from 1700 to the present. Impact of fashion on the stage. Practical experience preparing for departmental productions.

4813* Stage Costume Design. Lab 4 Prerequisites: 2413 and 2613 and 2623. Basic treatment of costume design; practical application through design sketches. Style of stage costume. Practical experience preparing for departmental productions.

5010* Seminar in Theater. 1-3 credits, maximum 12. Prerequisite: consent of instructor. Individual or group study of theory, history or literature of the theater. A term paper or written report and self-evaluation of the study or project is required.

5090* Individual Theater Projects. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Individual projects in directing, acting, or design and technology for a specified theater production, with concept, realization, and self-evaluation under faculty guidance.


5443* Problems in Advanced Directing. Prerequisites: 4443, consent of instructor. Problems in directing period styles, especially Shakespeare, Restoration comedy, absurdist drama. Preparation, rehearsal and staging of a complete production.

5453 Problems in Advanced Acting. Prerequisite: 3453, consent of instructor. Period styles in acting, special problems in television and film acting, auditioning techniques, special preparations for professional acting auditions.

TRADE AND INDUSTRIAL EDUCATION (TIED)

2000 Field Experience in Industrial Practice. 2-6 credits, maximum 16. Prerequisite: consent of instructor. Supervised, on-the-job experience in student's proposed teaching area with special emphasis on occupational skill development. Written agreement between student, employer and Department must be made prior to beginning of field experience program.

3000 Trade and Industrial Occupational Experience. 1-24 credits, maximum 24. Prerequisites: two years teaching experience, satisfactory completion of the required basic 16 credit hours of TIED courses and consent of instructor. Credit to be determined by a special skill competency examination.

3203 Introduction to Trade and Industrial Education. Opportunities provided by vocational education, with special emphasis on trade and industrial education and its relationship to other elements of the educational system. Legislative aspects of vocational education, general education, student guidance, and programs for disadvantaged and handicapped students.

4103* Instructional Procedures in Trade and Industrial Education. Prerequisite: 4344. Methods and techniques for effective teaching and learning in classroom and shop instruction. Emphasis on the use of instructional aids and competency development. No credit for students with credit in OAE 4103.

4110 Trade Technical Information. 1-4 credits, maximum 6. Prerequisite: consent of instructor. New developments in scientific and technical information and knowledge that are relevant to current trade practices.

4123* Coordinating Trade and Industrial Youth Activities. Youth clubs in vocational education at local, state and national levels. Procedures for planning programs of work, incorporation of youth activities into curriculum, adviser characteristics and responsibilities, fund-raising activities, and techniques for recognizing outstanding members and community supporters.

4214 Safety, Organization and Management of Learning Facilities. Techniques and procedures for organizing and managing shop and laboratory facilities and learner activities to enhance the quality of instruction and improve efficiency of equipment and space utilization including all safety rules and procedures.

4344 Trade Analysis and Instructional Planning. Analysis of the student's job activities; development of course outlines and specific instructional materials for shop and laboratory courses.

5114* Interdisciplinary Cooperative Education. Prerequisites: 3203 and 4344. Techniques and procedures for coordinating cooperative education programs. Includes planning, organizing, implementing and evaluating effective cooperative programs.

5153* Supervision of Vocational Education. Prerequisite: consent of instructor. Role and function of administrators responsible for supervising the planning, implementation and management of vocational education programs.

5223* Evaluation of Instruction. Prerequisite 4103. Principles of evaluation and methods for applying these principles to improve the effectiveness of vocational education programs.

5223* Teaching Related Information. Selection of job-related topics common to most trades with procedures for incorporating those topics into the regular curriculum.

5313 Guidance, Placement and Follow-Up in Occupational Education. Prerequisite: 4344. Teaching experience and guidance, placement and follow-up in occupational education.

5443 Individualizing Competency-Based Instruction Program. Develops knowledge and skills utilizing the concept of open entry/open exit necessary for planning, developing and implementing a competency-based vocational education program.

5653 Education and Industry Relations. Prerequisite: vocational teaching experience. Techniques for establishing and maintaining positive relationships between vocational industrial education, industry and the community.

5662* Conference Leading. Developing skills in organizing and leading conferences based upon individual and group behavior patterns.

5773* Related Information for Interdisciplinary Cooperative Education. Prerequisites: 3203 and 4344. Selection, organization and application of resources materials for direct and indirect related study in part-time cooperative classes.

5882* Practices and Problems of the Coordinator. Prerequisites: 4344 and 4444. Current practices and procedures in planning and coordinating interdisciplinary cooperative programs.

5910* Developing and Analyzing Teaching Content. 1-3 credits, maximum 6. Prerequisites: 4344 and consent of instructor. Provides opportunity for experienced teachers to incorporate the latest industrial technology into their course of study.

UNIVERSITY (UNIV)

1011 (S)American Studies Survey. Provides an overview of the development of American society and culture using an interdisciplinary approach. Study of U.S. culture from sociological, anthropological, linguistic, educational, political, geographical, economic, and historical perspectives.

2001* Academic Assessment and Evaluation. Prerequisite: acceptance into the University Academic Assessment Program or consent of instructor. Required for students in University Academic Assessment Program. Designed to help students identify reasons for experiencing academic difficulty; assess individual learning styles and personal characteristics; understand the educational system and current issues in American education; develop goals, attitudes and study skills needed to achieve academic success; and explore careers, majors, and alternative educational experiences. Does not apply toward total hours for graduation.
VETERINARY MEDICINE (VMED)

511 Veterinary Medical Orientation I. Prerequisite: first-year standing in College of Veterinary Medicine. Veterinary medical terminology, history and ethics of the profession, veterinary surveys of the biological kingdom, selected techniques and clinical presentations, and special topics. Graded on pass-fail basis.

522 Veterinary Medical Orientation II. Prerequisite: 511. Major breeds of animals; veterinary perspectives concerning animal production and marketing systems; selected techniques and clinical presentations; and special topics. Graded on pass-fail basis.

6611 Veterinary Medical Specialty Conference I. Prerequisite: third-year standing in College of Veterinary Medicine. Courses for third-year veterinary medical students presented by visiting professionals. A limited number of field trips will be conducted in which special presentations will be made.

6721 Veterinary Medical Clinical Conference I. Prerequisite: fourth-year standing in College of Veterinary Medicine. Presentation and discussion of selected clinical cases by fourth-year students and interdepartmental faculty groups. Graded on pass-fail basis.

6821 Veterinary Medical Clinical Conference II. Prerequisite: 6771. Presentation and discussion of selected clinical cases by fourth-year students and interdepartmental faculty groups. Graded on pass-fail basis.

6543 Clinical and Surgical Techniques I. Prerequisite: third-year standing in the College of Veterinary Medicine. Behavioral traits, physical examination and restraint of animals, introduction to clinical techniques of medicine and surgery relating to clinical handling of animals.

6544 Clinical and Surgical Techniques II. Prerequisite: third-year standing in College of Veterinary Medicine. Lectures and discussions of recent advances in domestic animals including principles of parturition and dystocia, genital diseases and breeding problems.

6545 Clinical and Surgical Techniques III. Prerequisites: 6514 and third-year standing in the College of Veterinary Medicine. Continuation of 6544.

6623 Surgery I. Prerequisites: 5422 and third-year standing in the College of Veterinary Medicine. Lectures and discussions in operative techniques and practice in veterinary surgery.

6624 Surgery II. Prerequisites: 6623 and third-year standing in the College of Veterinary Medicine. Lectures and discussions in operative techniques and practice in veterinary surgery.

6625 Surgery III. Prerequisites: 6623 and third-year standing in the College of Veterinary Medicine. Lectures and discussions in anatomical topics, operative techniques and practice in veterinary surgery.

6643 Clinical and Surgical Techniques II. Prerequisites: 6543 and third-year standing in College of Veterinary Medicine. Continuation of 6544.

6651 Foreign Animal Diseases. Prerequisite: third-year standing in College of Veterinary Medicine. Lectures and discussions involving diseases of the world. Emphasis on diseases which are a potential threat to United States livestock.

6703 Preceptorship Clinic. Prerequisite: fourth-year standing in College of Veterinary Medicine. Diagnosis, prognosis, prevention and treatment of diseases of animals presented in the preceptorship program.

6723 Small Animal Surgery Clinic. Prerequisites: fourth-year standing in College of Veterinary Medicine. Diagnosis, prognosis, prevention and treatment of surgical diseases of small animals are studied by assignment to the Small Animal Surgery Section of the Boren Veterinary Teaching Hospital.

6753 Small Animal Medicine Clinic. Prerequisite: fourth-year standing in College of Veterinary Medicine. Diagnosis, prognosis, prevention and treatment of diseases of small animals are studied by assignment to the Small Animal Medicine Section of the Boren Veterinary Teaching Hospital.

6756 General Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnoses, prognoses, treatment, and prevention of animal diseases. Students conduct introductory clinical studies by assignments in the following: food animals, small animals, equine, radiology, surgery and anesthesiology.

6757 Equine Medicine and Surgery Clinic. Prerequisite: fourth-year standing in College of Veterinary Medicine. Diagnosis, prognosis, prevention and treatment of diseases of small animals are studied by assignment to the Equine Section of the Boren Veterinary Medical Teaching Hospital.

6764 Special Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Special assignments for introductory clinical studies in the following: selected species clinic; herd-health program; necropsy, clinical pathology and parasitology, diagnostic laboratory, and special aspects of the basic sciences.

6773 Food Animal Medicine and Surgery Clinic. Prerequisites: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, prevention and treatment of diseases of the various species of food animals are studied by assignment to the Food Animal Section of the Boren Veterinary Medical Teaching Hospital.

6783 Field Services and Herd Health Clinic. Prerequisites: fourth-year standing in the College of Veterinary Medicine. Diagnostic, prognosis, and treatment of animal diseases cases presented to the Field Services unit and herd health studies of animals in herds, bands and flocks entered in health programs of the Boren Veterinary Medical Teaching Hospital.

6791 Elective I. Prerequisites: 6615 and fourth-year standing in College of Veterinary Medicine. Elective for selected areas of medicine and surgery. The diagnosis, prognosis, prevention and treatment of diseases of animals.

6811 Special Lectures and Discussions. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Special lectures and discussions of selected topics in Veterinary Medicine and Surgery.

6813 Intensive Care Clinic. Prerequisite: fourth-year standing in College of Veterinary Medicine. Diagnosis, prognosis and treatment of severe cases of animal disease including trauma cases.

6833 Radiology Clinic. Prerequisite: fourth-year standing in College of Veterinary Medicine. Students study the science and art of anesthetizing large and small animals while assigned to the Radiology Section of the Boren Veterinary Medical Teaching Hospital.

6843 Anesthesiology Clinic. Prerequisite: fourth-year standing in College of Veterinary Medicine. Students study the science and art of anesthetizing large and small animals while assigned to the Anesthesiology Section of the Boren Veterinary Medical Teaching Hospital.

6856 General Clinic II. Prerequisites: 6756 and fourth-year standing in the College of Veterinary Medicine. Diagnoses, prognoses, treatment, and prevention of animal diseases. Students conduct continuing clinical studies by assignments in the following: food animals, small animals, equines, radiology, surgery and anesthesiology.

6861 Special Clinic II. Prerequisites: 6764 and fourth-year standing in the College of Veterinary Medicine. Special assignments for continuing clinical studies in the following: selected species clinic; herd-health program; necropsy, clinical pathology and parasitology, diagnostic laboratory, and special aspects of the basic sciences.

6891 Elective II. Prerequisites: 6615, 6756, and fourth-year standing in the College of Veterinary Medicine. Elective for selected areas of medicine and surgery.

6900 Clinical Problems and Investigation. 1-6 credits, maximum 6. Elective for fourth-year standing in the College of Veterinary Medicine. Clinical research problems and techniques.

6910 General Clinic II. 1-6 credits, maximum 6. Prerequisite: 6756, or graduate standing in the College of Veterinary Medicine. Clinical research problems and techniques.

6920 Seminar. 1-3 credits, maximum 3. Prerequisite: graduate standing in the College of Veterinary Medicine or consent of the head of the department. Anesthesiology of animals.

6930 Comparative Anesthesiology. 1-3 credits, maximum 3. Prerequisite: graduate standing in the College of Veterinary Medicine or consent of the head of the department. Anesthesiology of animals.

6940 Special Clinic III. 1-4 credits, maximum 4. Prerequisites: fourth-year standing in the College of Veterinary Medicine and consent of the head of the department. Elective for selected areas of medicine and surgery. The diagnosis, prognosis, and treatment of diseases of animals in selected areas.

6950 Special Surgical Problems and Techniques. 1-5 credits, maximum 5. Lab 3-5. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Advanced training in surgical problems and techniques especially as they are related to research.
VETERINARY PARASITOLOGY, MICROBIOLOGY AND PUBLIC HEALTH (VPARA)

3123 Animal Hygiene. Prerequisite: junior standing in the College of Agriculture. Principles of sanitation and control of common diseases of livestock.

5000 Thesis. 1-6 credits, maximum 6. Prerequisite: senior standing with registration for graduate credit or graduate standing. Research problem for credit in meeting requirements of the M.S. degree under the supervision of a graduate faculty member and with permission of the Department head.

5110 Special Problems. 1-6 credits, maximum 6. Prerequisite: graduate standing or consent of department head. Special research problems in veterinary microbiology and parasitology.

5113 Veterinary Immunology. Lab 3. Prerequisite: first-year standing in the College of Veterinary Medicine or consent of instructor. Basic principles of immunology and their application to veterinary medicine.

5213 Diseases and Parasites of Wild Animals. Lab 1. Prerequisite: consent of instructor. A systematic approach to bacterial, viral and parasitic diseases of wild animals. Principles of disease transmission as it relates to individuals and populations of wild animals. Principles applicable to all areas of zoology, veterinary medicine and wildlife management. Same course as ZOOL 5593.

5224 Veterinary Bacteriology. Lab 2. Prerequisite: first-year standing in the College of Veterinary Medicine or consent of instructor. Pathogenic bacteria of domesticated animals. Fungi pathogenic for domesticated animals and their relationship to public health.

5242 Veterinary Biometry and Principles of Public Health. Prerequisite: first-year standing in the College of Veterinary Medicine. Statistics applied to biological observations applicable to veterinary medicine and principles of public health and epidemiology.

5313 Veterinary Virology. Lab 3. Prerequisite: second-year standing in the College of Veterinary Medicine or consent of instructor. Principles and standards applying to the maintenance of a wholesome food supply. Regulations and procedures for inspection of animals slaughtered for food and of food products of animal origin; and human nutrition, environmental and consumer aspects of food quality.

5322 Food Hygiene. Prerequisite: second-year standing in the College of Veterinary Medicine. Public health principles and standards applying to the maintenance of a wholesome food supply. Regulations and procedures for inspection of animals slaughtered for food and of food products of animal origin; and human nutrition, environmental and consumer aspects of food quality.

5323* Introduction to Public Health. Prerequisite: second-year standing in the College of Veterinary Medicine or consent of instructor. Relationship and responsibilities of the veterinarian to public health programs. Topics in community and environmental health.

5333 Veterinary Parasitology. Lab 3. Prerequisite: second-year standing in the College of Veterinary Medicine or graduate standing with major in certain biological sciences. Protozoan and external parasites of domestic animals.

5404* Techniques in Parasitology. Prerequisites: graduate standing and general parasitology; hematology or concurrent enrollment. Experimental application of basic research and teaching techniques in hematology and protozoology. Individual participation and analysis of experimental situations and techniques applicable to all areas of zoology.

5444 Veterinary Parasitology. Lab 2. Prerequisite: second-year standing in the College of Veterinary Medicine or graduate standing with major in certain biological sciences. Internal helminth parasites of domestic animals.

5523 Advanced Helminthology. Lab 3. Prerequisite: senior or graduate standing in zoology or entomology or graduate standing or consent of department head. Structure, taxonomy, life cycles and host-parasite relationships of helminth parasites affecting invertebrate and vertebrate animals.

5533 Veterinary Virology. Prerequisites: 5313, MICRO 4124 or equivalent. Discussion of theoretical and practical problems relating to the molecular biology of virus replication including virus structure and replication strategies, virus-host cell interactions, and antiviral mechanisms.

5613* Biology of Parasites. Prerequisites: graduate standing, general parasitology, or consent of instructor. A systematic and ecological approach to the study of parasitology. Host-parasite relationships, physiology, ecology and behavioral aspects of parasitic organisms.

5723 Parasitic Protozoa. Lab 3. Prerequisite: graduate standing in zoology or entomology or consent of instructor. Structure, life cycle, physiology, host-parasite relationships, and diagnosis concerned with protozoan parasites.

5833* Veterinary Diagnostic Microbiology. Lab 6. Prerequisite: graduate junior status or consent of instructor. Principles of differential diagnosis through laboratory methods employed in the isolation of microorganisms and application of these methods in the diagnosis of specific animal diseases.

6000 Research Thesis. 1-11 credits, maximum 45. Prerequisite: candidacy for the Ph.D. degree. Research problems for graduate student to meet thesis requirement of the Ph.D. degree.

6110 Seminar. 1-6 credits, maximum 6. Prerequisite: graduate standing. Subjects for study and discussion for graduate students.

6613* Public Health and Preventive Medicine. Prerequisite: third-year standing in the College of Veterinary Medicine or consent of instructor. The relationship of zoonotic diseases to community and environmental health. Epidemiologic principles in the practice of preventive veterinary medicine.

6711* Veterinary Preventive Medicine. Prerequisite: fourth-year standing in the College of Veterinary Medicine or consent of instructor. The uses of epidemiology in the practice of veterinary preventive medicine.

6753 Advanced Veterinary Epidemiology. Prerequisites: STAT 2013 or equivalent. The application of epidemiologic techniques to disease investigations in veterinary medicine. A group discussion format. Also a project involving the application of epidemiologic principles to population disease problems.

6823 Laboratory Animal Pathology. 1-2 credits, maximum 4. Prerequisite: fourth-year standing in the College of Veterinary Medicine or written consent of instructor. A systematic and experimental approach to bacterial, viral and parasitic diseases of domestic animals. Fungi pathogenic for domesticated animals and their relationship to public health.

6930 Pathology of Infectious Diseases. Prerequisite: 5425. Pathology of specific infectious diseases of animals, including those communicable to man and methods employed in their diagnosis.

6933* Neuropathology. Prerequisites: 5425, graduate standing and written consent of department head. Morphologic changes which occur in the nervous systems of the domesticated animals and the correlation of such lesions with recognized specific diseases.

6943* Advanced Oncology. Prerequisite: 5315. Neoplastic diseases of animals with emphasis on morphologic characterization, etiology, metastatic propensities and mechanisms and comparative relationships among different animal species.

6950 Advanced Systemic Pathology. 3-4 credits, maximum 18. Prerequisites: 5425, graduate standing or written consent of department head. Total credit not to exceed 6 for the M.S. degree and 12 for the Ph.D. Re-enrollment permits the study of 2 to 4 different groups of organs and systems of the animal body. A consideration of the pathogenesis and the morphological, biochemical, and comparative aspects of lesions found in organs and tissues of the domesticated animals.

6963 Advanced Clinical Pathology. Prerequisites: 5425 or equivalent, graduate standing, and written consent of department head. Applied clinical biochemistry, organ function tests and related cytologic examination.

6970 Advanced Hematology. Prerequisites: 5425, or equivalent, graduate standing, written consent of department head. The etiology and pathogenesis of the diseases of the blood and bone marrow.

VETERINARY PATHOLOGY (VPATH)

5000 Thesis. 1-6 credits, maximum 6. Prerequisite: graduate standing. Research in veterinary pathology, Graduate credit in meeting requirements of the M.S. degree.

5315 Veterinary Pathology I. Lab 2. Prerequisite: second-year standing in the College of Veterinary Medicine or consent of department head. Lectures in cellular and tissue pathology, pigments, inflammation, disturbance of growth and cirrhosis to lead into pathology of the various systems. The functional disturbances that accompany changes in structures, as well as the cause and pathogenesis of disease, are stressed. Students are taught to correlate altered structure and function with clinical signs.

5413* Clinical Pathology. Prerequisite: second-year veterinary standing or graduate standing with consent of department head. Laboratory methods used in evaluation of pathology conditions in animals. Hematology, urinalysis and clinical chemistry.

5425 Veterinary Pathology II. Lab 2. Prerequisite: 5315 or written consent of department head. Continuation of 5315.

5550 Pathological Techniques and Special Problems. 1-4 credits, maximum 20. Prerequisite: graduate standing in biological sciences. Techniques and methods used in diagnosis, technical work and research in pathology.

6000 Thesis. 1-15 credits, maximum 40. Prerequisite: graduate standing. Research in veterinary pathology. Graduate credit in meeting requirements of the Ph.D. degree.

6823 Pathology of Infectious Diseases. Prerequisite: 5425. Pathology of specific infectious diseases of animals, including those communicable to man and methods employed in their diagnosis.

6823 Diagnostic Pathology Clinic. Prerequisite: fourth-year standing in College of Veterinary Medicine. Participation in animal necropsy, clinical pathology and clinical parasitology laboratories to study diagnosis, prognosis, prevention and treatment of diseases. 1-2 credits, maximum 6. Prerequisite: graduate standing in biological sciences. Literature and research problems in veterinary pathology.

6890* Diagnostic Pathology. 1-4 credits, maximum 20. Prerequisite: graduate standing in the College of Veterinary Medicine or written consent of department head. A weekly review of current cases submitted to the Department and the methods employed in their diagnosis. Students examine necropsy reports, species and preparatory specimens individually and are required to formulate their own diagnosis.

6930 Laboratory Animal Pathology. 1-2 credits, maximum 2. Prerequisites: 6701 or written consent of department head. Etiology and pathogenesis of spontaneous and experimentally induced diseases of common used species of laboratory animals.

6943* Neuropathology. Prerequisites: 5425, graduate standing and written consent of department head. Morphologic changes which occur in the nervous systems of the domesticated animals and the correlation of such lesions with recognized specific diseases.

6943* Advanced Oncology. Prerequisite: 5315. Neoplastic diseases of animals with emphasis on morphologic characterization, etiology, metastatic propensities and mechanisms and comparative relationships among different animal species.

6950 Advanced Systemic Pathology. 3-4 credits, maximum 18. Prerequisites: 5425, graduate standing or written consent of department head. Total credit not to exceed 6 for the M.S. degree and 12 for the Ph.D. Re-enrollment permits the study of 2 to 4 different groups of organs and systems of the animal body. A consideration of the pathogenesis and the morphological, biochemical, and comparative aspects of lesions found in organs and tissues of the domesticated animals.

6963 Advanced Clinical Pathology. Prerequisites: 5425 or equivalent, graduate standing, and written consent of department head. Applied clinical biochemistry, organ function tests and related cytologic examination.

6970 Advanced Hematology. Prerequisites: 5425, or equivalent, graduate standing, written consent of department head. The etiology and pathogenesis of the diseases of the blood and bone marrow.
ZOOLOGY (ZOOL)

2104 Human Anatomy. Prerequisite: BISC 1603. Gross anatomy of the human body and its systems based on comparisons with nonhuman mammals dissected in the laboratory, with minor emphasis on embryology and histology.

2513 (N)Introduction to Wildlife Conservation. Prerequisites: BISC 1114 or 1303. The profession of wildlife conservation; the interdisciplinary nature of wildlife conservation is emphasized by lectures, guest speakers, films, and slide presentations.

3015 Biological Microtechnique. Lab 3. Prerequisite: BISC 1403 or 1603. Techniques for preparation of biological materials for microscopic examination. Same course as BOTT 3015.

3104 Invertebrate Zoology. Lab 4. Prerequisite: BISC 1603. Morphology, physiology, reproduction and ecology of major invertebrate groups.

3115 Vertebrate Morphology. Lab 6. Prerequisite: BISC 1603. Comparative gross anatomy of representative vertebrates with consideration given to embryology, histology and evolution.


3133 Evolution. Prerequisite: BISC 3003 or 3024. Development of the evolutionary concept: speculation, evolutionary mechanisms and phylogenetic concepts.


3204 (N) Introductory Anatomy and Physiology. Lab 2. Prerequisites: CHEM 1215 or equivalent and BISC 1214 or equivalent. Structure and function of the mammalian body. Lab sections specialized in human or domestic animal physiology. No credit for students with prior credit in 4215.

3423 Field Ornithology. Lab 4. Field work in identification, habits and life histories of birds.

3500 Conservation on Environmental Crises. 1 credit. Major emphasis on current environmental issues presented by films and speakers. Critiques written on several selected presentations.

3513 Principles of Wildlife Ecology. Prerequisite: 60 credit hours, including BISC 3024. Application of ecological principles to the production and control of natural populations.

3604* Vertebrate Natural History. Lab 6. Prerequisite: BISC 1603. Basic principles of ecology and functional organization: systematic, life histories, reproduction, behavior and ecological adaptations of vertebrates, emphasizing local fauna. One weekend field trip required.

3633 Regional Analysis and Planning. Prerequisite: BISC 1603. An introduction to methods of examining and analyzing regions. Examination and interpretation of the spatial, social and ecological aspects of regional planning. Same course as GEOG 3633.

3700 Readings and Special Studies in Zoology. 1-3 credits, maximum 6. Prerequisites: BISC 1603 and consent of instructor. Discussion of selected readings.

4103 General Parasitology. Lab 2. Prerequisite: 3104. Functional aspects of parasitism with emphasis on life cycles, disease conditions, epidemiology, diagnosis, treatment, historical significance, terminology, taxonomy and parasitological techniques.

4134 (L) Embryology. Lab 4. Prerequisite: 3115, BISC 3014, or consent of instructor. Biochemical basis of development with emphasis on gene regulation. Comparative developmental stages of sea urchin, frog, chick and pig. Experiments using frog and mouse, including the molecular levels.

4154 Herpetology. Lab 6. Prerequisite: BISC 3034 or consent of instructor. Systematics, evolution, distribution, life histories, ecology, behavior, techniques of collection and preservation of North American reptiles and amphibians. Three weekend field trips required.

4164 Ornithology. Lab 4. Prerequisite: BISC 1603. Classification, evolution, distribution, identification, life histories, and morphology of birds; ecological and behavioral adaptations of birds. One weekend field trip required.

4174 Mammalogy. Lab 4. Prerequisite: 3205 or consent of instructor. Classification, distribution, life histories, economic importance, techniques of field study, methods of collection and preservation of mammals.

4215 Mammalian Physiology. Prerequisites: CHEM 3015 and BISC 1603. Descriptive and quantitative functional analysis of the mammalian nervous, endocrine, respiratory, excretory, digestive, cardiovascular, musculoskeletal and reproductive organ systems. For majors in basic biology (including premedical, pre-dental and pre-veterinary) sciences.

4222* Mammalian Physiology Laboratory. Lab 6. Prerequisite: BISC 3015 or 3024. Laboratory experiments that illustrate function of organs, organ systems or mechanisms of whole body. For students majoring in basic biological sciences.

4233 Seminar in Physiology. Research and the integration of experimental biology with applied biology. Active participation by the student.

4243 Introduction to Pharmacology. Prerequisites: 3204 or 4215. Major drug classes based on their predominant action and/or principal activity in the body; basis for drug action and modern design of drugs and their action by physiological processes.

4253* General Vertebrate Histology. Lab 3. Prerequisite: 3115 or consent of instructor. Cellular structure of tissues and organs.

4264 Cell Physiology. Lab 2. Prerequisite: BISC 3014 or BIOCH 3563. Cellular activities and fundamental physiological processes.

4404* Ichthyology. Lab. 6. Prerequisite: 3115 or consent of instructor. Systematics, evolution, distribution and morphological, ecological and behavioral adaptations of fishes. Emphasis on Oklahoma forms. Two weekend field trips required.

4414* Fisheries Management. Lab 4. Prerequisite: BISC 3034. Techniques and principles involved in management of fishes. Field trip fee required.

4434* (L) Limnology. Lab 3. Prerequisite: BISC 3034. Physical, chemical and biological factors in lakes and streams.

4513 Wildlife Management. Prerequisite: 3513. Biological basis for the management of wildlife populations and habitats, with emphasis on current management problems.

4523 Wildlife Management Techniques. Prerequisite: 4513. ENGL 3323 strongly recommended. The semistructured format includes problem identification, project planning and analytical methods. Emphasis is on survey design and data interpretation, development of project area research/management recommendations and report preparation and presentation.

4532 Zoo Biology. Lab 3/day. Prerequisite: 4 hours of zoology or biology. An extension course taught at the Oklahoma City Zoo. Conservation of endangered species, animal acquisition and transport, restraint, sanitation and animal health, behavior, exhibit planning and architecture, zoo administration and research potential. Students undertake a research project in exhibit design. Lecturers include professional staff members of the Oklahoma City Zoo and guest speakers.

4700 Undergraduate Research Problems. 1-4 credits maximum. Prerequisite: consent of instructor. Participation in faculty research and/or execution of a problem formulated by the student.
5424  Analysis of Environmental Contaminants.  Lab 6.  Prerequisites: organic chemistry and graduate standing. Analytical methods for measuring environmental contamination or pollution; toxicity bioassay, gas chromatography, atomic absorption, infrared and ultraviolet spectrometry.

5433*  Advanced Fishery Science.  Lab 4.  Prerequisites: 4404, 4414, 4434, and 6 credit hours of statistics or consent of instructor. Application of ecological and evolutionary theory to problem solving in fishery research and management.

5443*  Aquaculture.  Lab 2.  Prerequisite: graduate standing or consent of instructor. Environmental and nutritional requirements, diseases and cultural practices affecting growth and production of aquatic animals. Three weekend field trips required.

5493  Wildlife Nutritional Ecology.  Prerequisite: 4523.  Basic nutritional principles for application in solving wildlife and fisheries management problems. Importance of nutrition in regulating wild animal populations through examination of the effects of malnutrition on recruitment, growth, disease, and survival. Techniques and skills for assessing both the nutritional suitability of the habitat and condition of the population.


5523*  Early Life History of Fishes.  Lab 3.  Prerequisites: 4404 and graduate standing or consent of instructor. Early life stages of fishes and the environmental factors influencing growth and survival during the first year of life.

5533*  Water Pollution Ecology.  Lab 6.  Prerequisite: 4434 or consent of instructor. Effects of pollution on the ecology of aquatic ecosystems. Effects of contaminants on the structure and function of ecosystems; ecology of plankton, fish and benthic macroinvertebrates.

5552*  Population Dynamics.  Prerequisites: BISC 3034, STAT 4013.  Quantitative approaches to population parameters and related processes. Natural regulation of numbers emphasized.

5563*  Woodland Wildlife Ecology.  Lab 3.  Prerequisite: 4513 or BISC 3034.  Vertebrate species diversity in the world's woodland and forested biomes. Changes imposed by land clearing and development and their effects upon wildlife diversity and populations. Options for wildlife conservation, from strict nature reserves to integrating wildlife habitat management into land use practices. Field trip required.

5573  Grassland and Desert Wildlife Ecology.  Prerequisite: BISC 3034.  Ecology of grasslands and deserts with emphasis on vertebrate species diversity, adaptations to semi-arid and arid ecosystems, and management problems associated with such habitats.

5583  Wetland Wildlife Ecology.  Lab 3.  Prerequisite: 4513 or consent of instructor. Ecology of various types of wetlands with emphasis on the management problems for waterfowl and furbearers.

5593*  Diseases and Parasites of Wild Animals.  Lab 2.  Prerequisite: consent of instructor. A systematic approach to bacterial, viral and parasitic diseases of wild animals. Principles of disease transmission as it relates to individuals and populations of wild animals. Principles are applicable to all areas of zoology, veterinary medicine and wildlife management. Same course as VPARA 5213.

6000*  Research for Ph.D. Dissertation.  1-15 credits, maximum 30.  Prerequisite: 30 credit hours of acceptable graduate work. Independent research for the Ph.D. dissertation under the supervision of a graduate faculty member.

6110  Advanced Physiology of Selected Systems.  Prerequisite: 4215 or PHSI 5125.  Advanced studies in gastrointestinal, cardiovascular, respiratory, excretory and neuroendocrine physiology. Each part of this sequential course may be taken for two credit hours. Student should ascertain the topics before registering for this course a second time. Same course as PHSI 6110.
INDEX

A
Abbreviations of Course Listings, 145
Academic Regulations, 25
Accounting, 62, 146
Accreditation, 6
see also specific colleges
Activities, Student, 18
Adding Courses, 11
Administration
Administrative Services, 62
Higher Education/Educational Administration, 71, 173
University, 2
Admission
Application, 7
Freshman, 7, 8, 9
High School Preparation for, 8
International Student, 9
Nonresident, 9
Readmission, 7, 9
Resident, 8
Transfer, 7, 9
Admission to the Graduate College
Chart, 115
Departmental or Program Requirements, 117
International, 116
Test Scores, 116
Transfer Credits, 117
Adult Education/Occupational, 73, 212
Advanced Standing Program, 8, 19
Advertising, 52
Advisement, 20
Aerospace/Mechanical Engineering, 87, 205
Aerospace Studies (Air Force), 53, 146
Agricultural
Communications, 33
Economics, 33, 147
Education, 34, 148
Engineering, 34, 80, 149
Agriculture, College of, 32
see also specific subjects
General, 35, 149
Mechanized, 34, 208
Agronomy, 36, 150
ALPHA Program, 11
Alumni Programs and Services, 24
Animal Science, 37, 151
Anthropology, 57, 153
Apartments, University, 17
Rates, 14
Application
Admission, 7
Housing, 7
Applied Behavioral Studies, 68, 153
Architecture, 81, 155
Area Studies Certificates, 41
Art, 43, 156
Arts and Sciences, College of, 40, 157
see also specific subjects
Assistantships, Teaching and Research, 110
Astronomy, 158
Athletics, 158
Auditing
Faculty and Staff, 12
Fee, 13
Aviation and Space Education, 69, 158
B
Bachelor's Degrees, 31
see also specific colleges
Behavioral Studies, Applied, 68, 153
Biochemistry, 37, 158
Biological Science, 59, 159
Botany, 44, 159
Broadcasting/Journalism, 51, 198
Business Administration, College of, 61
see also specific subjects
Department of, 63, 160
Business Communications, 160
Business Education, 161
Business Law, 161
Business Professions, 161
C
Calendar
University, 4
Graduate College, 107
Certificates, Area Studies, 41
Women's Studies, 41
Chemical Engineering, 82, 161
Chemistry, 45, 162
Child Development/Family Relations, 91, 180
Chinese, 163
Civil Engineering, 83, 163
Clothing, Textiles & Merchandising, 91, 166
College of
Agriculture, 32
Arts and Sciences, 40
Education, 67
Engineering, Architecture and Technology, 76
Graduate, 107
Home Economics, 90
Osteopathic Medicine, 97
Veterinary Medicine, 99
Communications
Agricultural, 33
Mass, 203
Speech, 57, 222
Community Services/Home Economics Education, 94, 191
Computer/Electronics Technology, 88, 176
Computer Engineering/Electrical, 84, 174
Computer Systems/Management Science, 65
Computing and Information Science, 46, 167
Construction Management Technology, 88, 168
Consumer Studies/Housing, Interior Design, 95, 193
Corrections, see Sociology
Costs
Auditing, 13
Correspondence Courses, 13
Estimated, 15
Extension Courses, 13
Facilities and Special Services, 13
Faculty/Staff Members, 14
General Fees (Nonresidents), 13
General Fees, (Residents), 13
Graduate Assistants, 14
Graduation Fee, 13
Obligation, 15
Residence Hall Rates, 14
Special Class Charges, 13
University Apartments, 15
Veterinary Medicine, 13
Counseling Services, 17
Course Listings, 145
Curriculum and Instruction Education, 70, 169
D
Degrees
Agriculture, 32
Arts & Sciences, 40
Business, 61
Education, 67
Engineering, Architecture and Technology, 76
Graduate, 119, 122, 123, 126
Home Economics, 90
Osteopathic Medicine, 97
Veterinary Medicine, 99
University Studies, 18
Extended Studies, 18
Listing, 31
Dentistry, Pre, 41
Disabled Student
Housing, 17
Services, 18
see also Facilities
Disruption of the Educational Process, Regents' Resolution, 30
Doctoral Degrees, 122, 123
see also specific departments
Dropping Courses, 11
Refund Policy, 14
E
Ecology, Wildlife and Fisheries, 59
Economics, 63, 171
Education, College of, 67, 172
see also specific subjects
Educational Administration and Higher Education, 71, 173
Electrical and Computer Engineering, 84, 174
Electrical Power Technology, 176
Electronics and Computer Technology, 88, 176
Employment, see Financial Aid
Engineering, Architecture and Technology, College of, 76, 177
see also specific subjects
Admission, 10, 77
General, 85, 185
Science, 177
Technology, 87
English, Department of, 46, 177
Enrollment Procedure
Continuing, 11
Faculty, Staff, 12
First-time, 11
Graduate, 117
Transfer Students, 11
Entomology, 38, 179
Environmental Science, 112, 180
Expenses, see Costs
Extended Studies, see University Studies,
Bachelor of
F
Facilities, 6, 21, 109
Family Relations and Child Development, 91, 180
Fees, see Costs
Finance, 64, 181
Financial Aid
see also specific colleges
Employment, 16
for Graduate Students, 110
Grants, 16
Loans, 16
Scholarships, 16
Work-study, 16
Index 231

Fire Protection and Safety Technology, 88, 182
Food, Nutrition and Institution Administration, 93, 182
Food Science, 112
Foreign Languages and Literatures, 48, 183
see also specific subjects
Forestry, 38, 184
Former Students, Readmission, 7, 9
Foundation, OSU, 24
Fraternities/Sororities, see Greek Organizations
French, 185
Freshman
Enrollment, 11
Nonresidents, 9
Oklahoma Residents, 8

G
General Administration, 185
General Education, 6
see also specific colleges
General Engineering, 85, 185
General Technology, 88, 185
Genetics, 186
Geography, 48, 186
Geology, 49, 187
German, 188
Graduate
Calendar, 107
Centers, 111
College, 107, 188
Council and Members, 108
Enrollment, 117
Programs, see specific departments
Regulations, 116
Graduation Requirements, see Academic Regulations
see also specific colleges
Greek, 188
Greek Organizations, 23
Grants, see Financial Aid

H
Health, 49, 188
Health Services, 17
Health, Physical Education and Leisure, 49, 189
High School Preparation, 8
see also specific colleges
Higher Education/Educational Administration, 71, 173
History, 50, 189
Home Economics
College of, 90
see also specific subjects
Department of, 94, 191
Education and Community Services, 94, 191
Honors and Service Organizations, 24
see also specific colleges
Honors Program, 18
see also specific colleges
Horticulture and Landscape Architecture, 39, 192, 199
Hospital, see Health Services
Hotel & Restaurant Administration, 95, 193
Housing
Application, 7
Disabled Student, 17
Greek Organizations, 23
Residence Halls, 16
University Apartments, 17
Housing, Interior Design and Consumer Studies, 95, 193
Identification Cards, 11
Industrial Engineering and Management, 86, 195
Industrial Technology Education, 72, 197
Interdisciplinary Studies, 197
Interior Design/Housing, Consumer Studies, 95, 193
International Student
Admission, 9
Graduate Admission, 116
Services, 18
Status Maintenance Fee, 13

J
Japanese, 197
Journalism and Broadcasting, 51, 198

L
Landscape Architecture/Horticulture, 39, 192, 199
Latin, 199
Law, Pre-, 19
see also specific colleges
Leisure, 49, 199
Library Science, 42, 200
Loans, see Financial Aid

M
Major fields, see specific colleges & degree listing
Management, 64, 200
Management Information Systems, 65
Management Science & Computer Systems, 65
Manufacturing Systems Engineering, 112
Marketing, 65, 202
Marketing Education, 73, 202
Mass Communications, 203
Master’s Degrees, 119
see also specific departments
MASUA Traveling Scholar Program, 19, 111
Mathematics, 52, 203
Mechanical and Aerospace Engineering, 87, 205
Mechanical Design Technology, 89, 207
Mechanical Power Technology, 89, 207
Mechanized Agriculture, 34, 208
Medical Technology, 44, 208
Medicine
Osteopathic, 97
Pre-, 19
see also specific colleges
Veterinary, 99
Mechandising/Clothing, Textiles, 91, 166
Microbiology, 44, 208
Military Science, 53, 209
Military Service
Fee Refund Policy, 14
Military Studies, Departments of, 53
Aerospace Studies, 53, 146
Military Science, 53, 209
Minority Programs and Services, 18
Minors, 41
Mission of the University, 6
Music, 54, 209
Fees, 13

N
Natural Science, 54, 112, 212
Nonresidents of Oklahoma
Costs, 13
Freshmen, 9
Pre-engineering, 9, 77
Transfers, 9
Nutrition/Food, and Institution Administration, 93, 182

O
Occupational and Adult Education, 73, 212
Off-Campus Program, 111
Office Management, 212
Oklahoma City, OSU Technical Branch, 25
Oklmulgee, OSU Technical Branch, 25
Organizations
Greek, 23
Honor and Service, 24
see also specific colleges
Osteopathic Medicine, College of, 97
Osteopathy, Pre-, 41

P
Parking
Fees, 13
Regulations, 11
Pathology
Plant, 39, 216
Speech, 57, 223
Veterinary, 100, 227
Personnel Management, 64
Petroleum Technology, 89, 212
Philosophy, 54, 213
Physical Education, 50, 213
Physical Examination, 7
Physics, 55, 214
Physiology, 59
Physiological Science, 99, 215
Placement, University, 21
Plant Pathology, 39, 216
Political Science, 55, 216
Preprofessional Programs, 19
see also specific colleges
Privacy, Students’ Rights, 12
Professional Degrees, Doctor of Osteopathy, 97
Veterinary Medicine, 99
Profile, Student, 6
Psychology, 56, 218
Public Relations, 52

R
Radio/TV/Film, 52
Readmission, 7, 9
Research Centers, 109
Refund, Withdrawal and Drop Fee Policy, 14
Regents
for Higher Education, State, 2
for OSU, Board of, 2
Regulations
Academic, 25
Graduate, 116
Parking, 11
Religious Studies, 56, 220
Residence Halls
Life, 16, 24
Rates, see Costs
see also Housing
Residency Status, 7
Residents
Costs, 13
Freshmen, 8
High School Seniors, 8
Special Adult Admission, 8
Transfers, 9
Restaurant Administration/Hotel, 95, 193
ROTC, see Military Studies, Departments of
Russian, 220

S
Safety Technology/Fire Protection, 88, 182
Scholarships, see Financial Aid
Science, see specific subjects
Scholarship-Leadership Enrichment Program, 19
Semester at Sea, 19
Sociology, 56, 220
Sororities/Fraternities, see Greek Organizations
Space Science Education, 69
Spanish, 222
Specialist in Education Degrees, 126
see also specific departments
Speech Communication, 57, 222
Speech & Language Pathology & Audiology, 57, 223
Statistics, 58, 223
Study Abroad, 19

T
Teacher Education Programs, 73
Graduate, 111
Technical
Branch, Oklahoma City, 25
Branch, Okmulgee, 25
Education, 73, 224
Technology, Division of Engineering, 87
General, 88, 185
Theater, 58, 224
Trade and Industrial Education, 73, 225
Transcripts, 12
Transfers
Enrollment, 11
Graduate College, 117
Nonresidents, 9
Residents, 9
Tuition, see Costs
Tulsa, University Center at, 19, 111

U
University, 225
University Center at Tulsa, 19, 111
University Studies, Bachelor of, 18
see also specific colleges

V
Vehicle Registration and Parking
Regulations, 11
Veterinary Medicine, College of, 99, 226
Costs, 13
Medicine and Surgery, 100, 226
Parasitology, Microbiology and Public Health, 100, 227
Pathology, 100, 227
Pre-, 33, 41

W
Wildlife and Fisheries Ecology, 59
Withdrawing from the University, 11
Refund Policy, 14
Women's Studies Certificate, 41

Z
Zoology, 59, 228