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.

For information, write to Oklahoma State University, Stillwater, OK 74078, or call (405)744-5000; in Oklahoma, call toll free 1-800-522-6809.

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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, admission, employment, financial aid and educational services.
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GEORGE B. KAISER, Vice-Chairman, Tulsa
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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
GENE SATTERFIELD, Ph.D., Interim Vice-President for Business and Finance
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ROBERT L. SANDMEYER, Ph.D., Dean of the College of Business Administration
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CLYDE B. JENSEN, Ph.D., President of the College of Osteopathic Medicine (Tulsa)
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EDWARD R. JOHNSON, Ph.D., Dean of Libraries
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
JERRY L. GILL, Ph.D., Interim Director of High School and College Relations
DAVID PATTERSON, Ph.D., Interim Director of the University Honors Program
ROBERT E. GRAALMAN, Ph.D., Director of University Scholarships
ROBIN H. LACY, Ed.D., Registrar and Director of Admissions
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University Calendar

First Semester 1990-91, Fall

August 20-24, Monday-Friday
Enrollment
August 24, Friday
Last day to cancel enrollment
August 27, Monday
Class work begins
August 31, Friday
Last day to enroll
August 31, Friday
Last day for 80% refund on withdrawal

September 3, Monday
University holiday
September 4, Tuesday
Last day to add
September 7, Friday
Last day to file a diploma application
September 10, Monday
Last day to drop a course with no grade and no fees charged for course
September 10, Monday
Last day for 50% refund on withdrawal
September 17, Monday
Last day for 25% refund on 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 a "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, Monday through Tuesday
University holidays
January 3, Thursday
Grades due from faculty

Winter Intersession

December 10-14, Monday-Friday
Enrollment
December 24, Monday
Intersession begins

Second Semester 1990-91, Spring

January 4, Friday
Intersession ends

January 7-11, Monday-Friday
Enrollment
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 for 80% refund on withdrawal
January 21, Monday
Last day to add
January 25, Friday
Last day to file a diploma application
January 25, Friday
Last day to drop a course with no grade and no fees charged for course
January 25, Friday
Last day for 50% refund on withdrawal
February 1, Friday
Last day for 25% refund on withdrawal
February 22, Friday
Last day to drop or withdraw with "W"

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

Summer 1991

Regular 8-Week Summer Session

May 27, Monday
University holiday
May 30, 31, Thursday, Friday
Enrollment
May 31, Friday
Last day to cancel enrollment
June 3, Monday
Class work begins
June 4, Tuesday
Last day for 80% refund on withdrawal
June 5, Wednesday
Last day to enroll

June 5, Wednesday
Last day to add
June 6, Thursday
Last day for 50% refund on withdrawal
June 7, Friday
Last day to file a diploma application
June 7, Friday
Last day to drop a course with no grade and no fees charged for course
June 7, Friday
Last day for 25% refund on withdrawal
June 21, Friday
Last day to drop or withdraw with
July 4, Thursday
University holiday
July 5, Friday
Last day to drop with "WP" or "WF"
July 12, Friday
Last day to withdraw with "WP" or "WF"
July 29, Monday
Class work ends (makeup exams)

First Semester 1991-92, Fall

August 19-23, Monday-Friday
Enrollment
August 23, Friday
Last day to cancel enrollment
August 26, Monday
Class work begins
August 30, Friday
Last day to enroll
August 30, Friday
Last day for 80% refund on withdrawal
September 2, Monday
University holiday
September 3, Tuesday
Last day to add
September 6, Friday
Last day to file a diploma application
September 9, Monday
Last day to drop a course with no grade and no fees charged for course
September 9, Monday
Last day for 50% refund on withdrawal
September 16, Monday
Last day for 25% refund on withdrawal
October 4, Friday
Last day to drop or withdraw with "W"

October 7, 8, Monday, Tuesday
"Monday" classes will meet
October 9, Friday
Progress reports for freshmen due from faculty
November 1, Friday
Last day to drop a course with no grade and no fees charged for course
November 1, Friday
Last day for 80% refund on withdrawal
November 28, Thursday
University holiday begins
December 2, Monday
Class work resumes
December 6, Friday
Last day to withdraw with a "WP" or "WF"

December 9-13, Monday-Friday
Pre-finals week

December 16-20, Monday-Friday
Final examinations

December 20, Friday
Class work ends

December 24-January 1, Tuesday through Wednesday
University holidays

January 2, Thursday
Grades due from faculty

Winter Intersession
December 9-13, Monday-Friday
Enrollment

December 23, Monday
Intersession begins

January 3, Friday
Intersession ends

Second Semester 1991-92, Spring
January 6-10, Monday-Friday
Enrollment

January 10, Friday
Last day to cancel enrollment

January 13, Monday
Class work begins

January 17, Friday
Last day to enroll

January 17, Friday
Last day for 80% refund on withdrawal

January 20, Monday
Last day to add

January 24, Friday
Last day to file a diploma application

January 24, Friday
Last day to drop a course with no grade and no fees charged for course

January 24, Friday
Last day for 50% refund on withdrawal

January 31, Friday
Last day for 25% refund on withdrawal

February 21, Friday
Last day to drop or withdraw with "W"

March 6, Friday
Progress reports for freshmen due from faculty

March 7, Saturday
Spring break begins

March 16, Monday
Class work resumes

March 23, Monday
Enrollment for Fall begins

March 27, Friday
Last day to drop with a "WP" or "WF"

April 24, Friday
Last day to withdraw with a "WP" or "WF"

April 27-May 1, Monday-Friday
Pre-finals week

May 4-8, Monday-Friday
Final examinations

May 8, Friday
Class work ends

May 9, Saturday
Commencement

May 13, Wednesday
Grades due from faculty

Summer 1992
Regular 8-Week Summer Session
May 25, Monday
University holiday

May 28, 29, Thursday, Friday
Enrollment

May 29, Friday
Last day to cancel enrollment

June 1, Monday
Class work begins

June 2, Tuesday
Last day for 80% refund on withdrawal

June 3, Wednesday
Last day to enroll

June 3, Wednesday
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July 3, Friday
University holiday

July 6, Monday
Last day to drop with "WP" or "WF"

July 10, Friday
Last day to withdraw with "WP" or "WF"

July 27, Monday
Class work ends (makeup exams)

July 29, 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 1990 their names were changed to OSU-Okmulgee and OSU-Oklahoma City. In July of 1988, the Oklahoma College of Osteopathic Medicine and Surgery became the College of Osteopathic Medicine of OSU.

OSU is located in Stillwater, a north-central Oklahoma community with a population of more than 42,000. Stillwater is approximately 60 miles from the Tulsa and Oklahoma City metropolitan areas and is readily accessible from other major population centers by interstate highway and air. The University is coeducational and has an enrollment of approximately 26,000 students on its four campuses. It 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 in Education 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. 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 modern research laboratories and equipment, excellent physical education, recreation and student union facilities, nationally-recogized residence halls programs, outstanding cultural events, and 37 nationally-affiliated fraternities and sororities, all provide a stimulating educational and social environment.

The Mission

As one of Oklahoma's two land-grant institutions of higher learning, OSU is engaged in resident and off-campus instruction, research, extension education, and public service. The University's mission includes the discovery, preservation, and transmittal of useful knowledge, both basic and applied. The goal of its many academic and public-service programs is to serve the broad educational needs of students and other clientele groups, enhancing and enriching the quality of human 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 25,990 students, more than 20,100 are on the Stillwater campus, 2,000 at Okmulgee and 3,600 at Oklahoma City. As well as nearly 750 students at the University Center at Tulsa and 320 students at the College of Osteopathic Medicine in Tulsa. Ninety percent of the undergraduate enrollment is from Oklahoma; six percent from other states; and four percent from more than 25 foreign countries. Of the undergraduate population, 54 percent are men and 46 percent are women. Minorities make up nine percent of the undergraduate student body.

The graduate student enrollment totals 4,156. Of these students, approximately 700 enroll through the University Center at Tulsa. Seventy-one percent are from Oklahoma; 10 percent from other states; and 19 percent from foreign countries. Of the graduate population, 56 percent are men and 44 percent are women. Minorities make up nine percent of the graduate student body.

Facilities

The OSU campus is one of exceptional beauty, with modified Georgian style architecture in many of the 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, located eight miles west of Stillwater, is also owned by OSU. The area includes approximately 21,656 acres, including the 3,000-acre Lake Carl Blackwell which provides the water supply for OSU. It is also used for research activities, in addition to being a popular regional recreational area.

Additional properties include approximately 1,900 acres in 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, the Bureau of Professional Education of the American Osteopathic 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 opportunity 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.

Enter 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
Linda Peale, Coordinator, Admissions Programs
Karen R. Mott, Coordinator, Transfer Credit Evaluations

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 assure 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 classification 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 residence 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 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: An individual who is not a citizen of the United States may become eligible for classification as an Oklahoma resident provided that he or she holds permanent resident status as defined by the Immigration and Naturalization Service, evidenced by the issuance of a green card or amnesty card, who has resided in Oklahoma for at least 12 consecutive months following issuance of the green card or amnesty card, and who meets the criteria for establishment of domicile.

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.

Full-time Professional Practitioner or Worker: An individual who provides evidence of having come to Oklahoma to practice a profession on a full-time basis, conduct a business full-time, or work on a full-time basis shall be admitted along with his or her spouse and dependent children without payment of nonresident tuition so long as he or she continues in such full-time employment capacity.

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 15,000 high school students make the decision to enter college.

Students with the ability to think clearly, to reason, to employ scientific method, to use language effectively, and to apply knowledge, are those who will become the masters of their destinies 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:

- Computer science
- Government
- Economics
- Psychology
- Foreign language
- Sociology
- Geography
- Speech

Oklahoma Residents

Freshman Admission. For the Fall 1990 or Spring 1991 Semester: to be admissible, students must graduate from accredited high schools, participate in either the American College Test (ACT) or a similar acceptable standardized test, and satisfy at least one of the following:

1. maintain a four-year high school grade-point average of 3.00 or higher on a 4.00 grading scale, and rank scholastically among the top one-half of their class; or
2. attain a composite score of 21 or higher on the enhanced ACT or an 820 on the SAT.

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 "probational," 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 a High School Student.

1. A senior student enrolled in an accredited Oklahoma high school may, if he or she meets the requirements set forth below, be admitted provisionally as a special student.
   a. He or she must meet the published criteria of the State Regents (other than high school graduation and curricular requirements) for admission. This includes having participated in the American College Testing program (ACT) or a similar battery of tests (Scholastic Aptitude Test-SAT).
   b. He or she must be enrolled in less than a full-time load (fewer than six credit courses per semester) at the high school which he or she is attending, as attested by the high school principal.
Transfer Admission. For the purpose of determining college admission, no later than the spring of the senior year, as attested by the high school principal.

1. Students who would have satisfied the admission requirements for the fall or spring semester as first-time freshmen are eligible to enroll as transfer students after earning at least 24 semester credit hours according to the retention standards listed below.

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

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 to 36</td>
<td>1.60</td>
</tr>
<tr>
<td>37 to 72</td>
<td>1.80</td>
</tr>
<tr>
<td>73 or more</td>
<td>2.00</td>
</tr>
</tbody>
</table>

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 admitted 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 college 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 prior to entry.
2. Transfer students seeking admission to OSU from colleges or universities accredited by a regional association may be given full recognition for their credits earned prior to entry.

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 prior to entry. 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 prior to entry.
2. Transfer students seeking admission to OSU from colleges or universities accredited by a regional association may be given full recognition for their credits earned prior to entry.

Alternative Admission Programs

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 in 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. 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 the certified true copies of his or her secondary records and official transcripts from his or her current institution in the United States. The international student should contact his or her foreign student adviser 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.
3. An official Test of English as a Foreign Language (TOEFL) score of 500 or above on the examination taken within the last two years.
4. Documented evidence of financial support.
5. 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 adviser 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.

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. The international student is eligible for academic admisibility under this criteria only if he or she were admissible as a first-time freshman based on his or her academic credentials from abroad.

b. The international student who would not have been eligible for academic admission as a first-time freshman based on his or her academic credentials from abroad, will be eligible 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.

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 admisibility into the engineering program after earning at least 24 semester credit hours at another U.S. institution and having an overall of 2.70 GPA on a 4.00 scale as well as having a 2.50 overall GPA in engineering related courses from that institution in the United States, and a 2.00 over the immediate past semester before transferring.

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 I-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 must complete.

The University has no financial aid available for 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, they must be admitted to the University and then be counseled by academic advisers regarding international student to understand the INS regulations and to abide by them.

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
Paula M. Barnes, Coordinator, Athletes’ and Veterans’ Eligibility
Joan M. Payne, Coordinator, Certification Services
Vera M. Bilyeu, Coordinator, Enrollment Services
Shirilyn Dehls, 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 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. Priority for these enrollment periods addresses the needs of students in relation to graduation proximity, with priority based on number of hours earned. Prior to the specific enrollment periods, students and academic advisers consult regarding course selections. The Trial Schedule 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. Certain groups of students are extended the option of enrolling prior to the time continuing students begin enrolling. Physically handicapped students are extended the option of priority enrollment. Those students actively participating in the University 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. Wentz scholars are also extended the option of 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 through the third day of a summer session or on the first day of a summer short course. A student enrolling late 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 sixth class day of a regular semester or the third class day of a 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 second week of a regular semester or the first week of a 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 deadline for dropping with no record, 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 10th 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. The grade of “WF” will be calculated in the grade-point average.

After the 10th week of a regular semester, or the fifth week of a summer session, or proportionate periods for block or short courses, a student may 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 at the end of the semester. (Exceptions to this policy may be allowed by petition due to extraordinary circumstances. A petition requires the signatures of the student’s instructor, adviser and dean with the grade of “WP” or “WF” assigned by the instructor.)

A student may not drop any course in which a formal charge of academic dishonesty is pending against the student. If the student is absolved of the formal charge, he or she may drop the course with either a “W,” “WP” or “WF,” (according to the drop grade policy), appearing on the academic record. If the student is found guilty, the instructor may take appropriate disciplinary action, including assigning the grade “F” for the assignment or the course.

Withdrawing from the University

The withdrawal process is initiated in the student’s dean’s office. The student should appear in person, request an official withdrawal, and hand carry the form to the appropriate offices to complete the process. If the student is unable to appear...
in person, the request for withdrawal may be initiated through the mail or by phone to 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 will receive a grade of "W" (withdrawn). 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" (withdrawn passing) or "WF" (withdrawn 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.

Vehicle Registration and Parking Regulations

Any vehicle driven in the City of Stillwater or on the campus of the University by an OSU student should be currently registered with the Department of Public Safety. When a vehicle is registered, the student will be given an OSU vehicle registration decal at no cost. The decal is solely for the purpose of registration and does not afford the student on-campus parking privileges.

Each student is allowed one paid parking permit. The parking permit fee is charged to a student's OSU account. In order to obtain a parking permit, the following items should be presented to the OSU Police Department: a copy of the vehicle registration, a completed "Vehicle Registration" card, student I.D., and, if living in a residence hall, a "Residence Hall Vehicle Registration" form.

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, they are checked against bicycle serial numbers maintained in the registration files for return to the rightful owners.

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 attention to early deadlines for application for grants, scholarships, work-study, and Perkins Loans. While the needs and resources of each student differ, the University can provide a general list of fees and expenses normally encountered. Students should note that fees are subject to change without notice. The figures which follow are for the 1989-90 academic year.

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.

<table>
<thead>
<tr>
<th>Oklahoma Residents</th>
<th>Lower-division courses</th>
<th>Upper-division courses</th>
<th>Graduate-division courses</th>
<th>Nonresidents of Oklahoma</th>
<th>Graduate-division courses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$ 41.30 General fee</td>
<td>$ 44.30 General fee</td>
<td>$ 58.20 General fee</td>
<td>$ 41.30 General fee</td>
<td>$ 58.20 General fee</td>
</tr>
<tr>
<td></td>
<td>2.15 Required student activity fee</td>
<td>2.15 Required student activity fee</td>
<td>2.15 Required student activity fee</td>
<td>2.15 Required student activity fee</td>
<td>2.15 Required student activity fee</td>
</tr>
<tr>
<td></td>
<td>3.60 Required facility fee</td>
<td>3.60 Required facility fee</td>
<td>3.60 Required facility fee</td>
<td>91.70 Nonresident tuition</td>
<td>91.70 Nonresident tuition</td>
</tr>
<tr>
<td></td>
<td>$ 47.05 Total per credit hour</td>
<td>$ 50.05 Total per credit hour</td>
<td>$ 63.95 Total per credit hour</td>
<td>$ 138.75 Total per credit hour</td>
<td>$ 155.45 Total per credit hour</td>
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<tr>
<td></td>
<td>$ 36.00 Required Student Health Center fee per semester*</td>
<td>$ 36.00 Required Student Health Center fee per semester*</td>
<td>$ 36.00 Nonresident tuition per semester*</td>
<td>$ 36.00 Required Student Health Center fee per semester*</td>
<td>$ 36.00 Required Student Health Center fee per semester*</td>
</tr>
</tbody>
</table>

College of Veterinary Medicine

<table>
<thead>
<tr>
<th>Oklahoma Residents</th>
<th>Lower-division courses</th>
<th>Upper-division courses</th>
<th>Graduate-division courses</th>
<th>Nonresidents of Oklahoma</th>
<th>Graduate-division courses</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>$1,770.00 General fee per semester</td>
<td>$1,770.00 General fee per semester</td>
<td>$1,770.00 General fee per semester</td>
<td>$1,770.00 General fee per semester</td>
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<td>2.15 Required student activity fee per credit hour</td>
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<td>3.60 Required facility fee per credit hour</td>
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<td>3.60 Nonresident tuition per semester</td>
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<td></td>
<td>$ 36.00 Required Student Health Center fee per semester*</td>
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<td>$ 36.00 Required Student Health Center fee per semester*</td>
<td>$ 36.00 Required Student Health Center fee per semester*</td>
</tr>
</tbody>
</table>

Fees for Facilities and Special Services

Students regularly enrolled in the University are assessed facility fees which entitle them to use the Student Union, the Colvin Physical Education Center, the Wellness 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 typically 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:
Maximum
Late enrollment fee $5.00 first day, $10.00 maximum
Irregular examination fee $1.00
Books and supplies used by the student are binding fee $6.00 each
Doctor of Education degrees $20.00 Thesis
Doctor of Veterinary Medicine degree $12.50
Master's degree $15.00
Bachelor's degree $10.00
SCH in addition to the fees listed above.
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 and policy 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. The Office of International Programs at OSU is the designated office to coordinate, expedite, and administer all aspects of procedures pertaining to such programs of education and training. Sponsors should direct all matters to the University's Office of International Programs.
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 for credit 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 not 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.
Drop Fee Policy
A student dropping a course prior to the end of the second week of a regular semester or the first week of a summer session will receive a 100 percent refund of fees. No refund of fees will be given for courses dropped after the second week of a regular semester or the first week of a summer session.
Withdrawal Fee Policy
A student withdrawing from the University during the first three weeks of a regular semester or during the first week of a summer session will receive a refund of a percentage of total fees. The percentage of fees to be refunded:
Prior to the first week of a semester or summer session-
100 percent
During the first week of a semester or the first two days of a summer session-80 percent
During the second week of a semester or the third or fourth days of a summer session-50 percent
During the third week of a semester or the fifth day of a summer session-
25 percent
After the third week of a semester or the first 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 Women's Halls
East Bennett West Bennett
Kerr Drummond
Parker Scott
Stout Stout
Wentz Wentz
Willham South Willham North
Iba Iba

Residence Hall Rates (Rates include a telephone instrument and local phone service in each room. Cable TV service is provided in floor lounges.)

Room Type/Meal Plan Semester Charge
Double Room/5 Meal Plan $953.00
Double Room/10 Meal Plan $1,173.00
Double Room/15 Meal Plan $1,202.00
Double Room/20 Meal Plan $1,233.00
Double Room/No Food Service $590.00

Kerr-Drummond and Scott-Parker Residence Halls (Air conditioned. Rates include a telephone instrument and local phone service in each room. Cable TV service is provided in floor lounges.)

Room Type/Meal Plan Semester Charge
Double Room/5 Meal Plan $1,030.00
Double Room/10 Meal Plan $1,250.00
Double Room/15 Meal Plan $1,279.00
Double Room/20 Meal Plan $1,310.00
Double Room/No Food Service $667.00

Stout Residence Hall
(Stout is open only to students who are sophomores and above. Rates include a
**Wentz*, William North and South Residence Halls**

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

<table>
<thead>
<tr>
<th>Room Type/Meal Plan</th>
<th>Semester Charge</th>
</tr>
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<tbody>
<tr>
<td>Double Room/5 Meal Plan</td>
<td>$936.00</td>
</tr>
<tr>
<td>Double Room/10 Meal Plan</td>
<td>$1,156.00</td>
</tr>
<tr>
<td>Double Room/15 Meal Plan</td>
<td>$1,185.00</td>
</tr>
<tr>
<td>Double Room/20 Meal Plan</td>
<td>$1,216.00</td>
</tr>
<tr>
<td>Double Room/No Food Service</td>
<td>$573.00</td>
</tr>
</tbody>
</table>

**Iba Residence Hall**

(Air conditioned. Iba is open only to graduate sophomores and above.

<table>
<thead>
<tr>
<th>Room Type/Meal Plan</th>
<th>Semester Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Room/No Food Service</td>
<td>$686.00</td>
</tr>
</tbody>
</table>

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

**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
  - University Housing: 1,327.00
  - 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
  - University Housing: 1,327.00
  - 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 Garofolo, Assistant Director, Programs
- Linda K. Good, Coordinator, College Work Study Programs
- Margaret Betts, Coordinator, Information Services
- B. B. Butler, Coordinator, Records
- Cheryl Gebhart, Coordinator, Reports
- Bonnie Joerschke, Senior Counselor
- Thressa Bowler, Counselor
- Gary Davidson, Counselor
- Judith Finnegar, Counselor
- Cathy Gose, Counselor
- Jeff Sinderson, Counselor
- Konnie Gindrup, Manager, Financial Aid

**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.

Fees and tuition 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.
Funds Advance through 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.

LO$-

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.

Wentz Service 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. Transfer scholarships are offered each year to students transferring from junior colleges to OSU. Applicants must apply for admission by March 1. 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. Application for these scholarships can be obtained from the Office of Student Financial Aid and must be received by March 15.

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 experience. 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 applying for 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 full work load of 40 hours per week. Students are informed of job opportunities both on campus and 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-Administrative and Business Services
Dane Blauhage, 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
Dave Stoddart, Assistant Director of Residential Life-University Apartments

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 who do not. 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 nutritional, convenient, and enjoyable. All freshmen live in residence halls. Exceptions can be made 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); or having completed 27 credit hours. Exceptions must be requested in writing, and approved by the Office of Residential Life.

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 six months before the desired occupancy 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 undergraduate students who are 21 years of age or older. Stout and Wentz halls are available for students of sophomore standing and above.

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. Residence halls and dining centers offer numerous 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

Alice F. Gambill, M.D., Assistant Director
Donald L. Cooper, M.D., Staff Physician and Director of Athletic Medicine
O. Joseph Hake, M.D., Staff Physician
Thomas L. Hansen, M.D., Staff Physician
Ngheim 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 a satisfactory 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 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.

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 students, and single, upperclass, undergraduate students. Priority for single students is given to those who have lived in the residence halls. 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 campus. The Family Resource Center located in 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.
staff of seven full-time physicians, three staff psychologists, 12 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

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 Newsom, 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 Hasley, 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 programs and services to promote academic and social adaptation; and be advocates for students throughout the University and the community.

The staff in the International Student Services office is responsible for advisement to students and faculty on matters which are unique to international students and scholars. Personal counseling, financial planning, liaison with embassies and consulates, legal referrals, academic referrals, immigration matters, orientation programs, and advisement 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 new 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.

Student Activities

Jan Carlson, Manager, Student Activities
James Jordan, Coordinator of Greek Life
Marie Basler, Program Adviser, Off-Campus Students
Marlon Morgan, Program Adviser, Sorority Affairs
Kathryn Andre, Program Coordinator, Allied Arts

The Office of Student Activities is located in the basement level of the Student Union. This office is responsible for the program development of several student organizations and serves as the liaison with all student groups. The staff of this unit advises Student Government Association, Off-Campus Students Association, fraternities and sororities, Returning Students Association, as well as other student leadership groups. This office also develops training programs for student leaders.

Also included in Student Activities is the Office of Student Union Programs. The staff of this area advises the Student Union Activities Board and is responsible for the program development within
the Student Union. These programs include films, speakers, exhibits, Freshman Follies, as well as other special events within the Student Union.

Special Programs, Services and Facilities

Special Programs

The Honors Program

The University Honors Program is composed of a university-wide General Honors component and specialized components at the departmental or college levels. The Honors Program provides academically talented students with the opportunity to study, conduct research, and exchange ideas in an exciting and supportive academic environment. Honors sections are offered in many general education courses, and special honors seminars and interdisciplinary honors courses also are available. Honors classes are taught by outstanding faculty members, and the classes are small in size to facilitate active student involvement.

Completion of the requirements for the General Honors award leads to special designation on the student’s OSU transcript, as does completion of the requirements for the Departmental or College Honors award in the student’s academic major. Students earning the Departmental or College Honors award as well as the General Honors award receive the bachelor’s degree with honors including a special entry on their transcripts and a special honors diploma.

Additional advantages to active participants in the Honors Program (minimum of three honors credit hours per semester) include use of the Honors Program Study Lounge in the Edmon Low Library (with Apple Macintosh and IBM personal computers), extended check-out privileges for library materials, and priority enrollment for the following semester.

Admission of new freshmen to the University Honors Program is based on an ACT composite score of 27 or higher. New freshmen with ACT scores of 25 or 26 may be admitted to the program upon recommendation of their academic college after a review of their high school transcripts. No formal application is required, but students must obtain an “honors stamp” on their Trial Schedule form prior to enrolling in honors courses. Students other than new freshmen may be admitted to the program on the basis of their cumulative grade-point averages (3.25 at the end of the freshman year, 3.37 at the end of the sophomore year, and 3.50 at the end of the junior year) and, in the case of transfer students, ACT composite scores in addition to these cumulative grade-point average levels.

For additional information about the University Honors Program, interested students should consult the Director of the University Honors Program, 509 Edmon Low Library.

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. This option may be available in some colleges. It 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 including 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 at 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.

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
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.

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 University Academic Services. Each college structures its advising system based upon the college's philosophy and perceived student needs. Hence, academic advising is performed with the cooperation of the appropriate deans and department heads, and is performed by academic deans and their staffs, who have the knowledge and experience necessary to counsel individual students. 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.

University Academic Services

The Office of University Academic Services (UAS) 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 UAS 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 UAS is to provide personal attention and assistance to students as they explore the various academic options available to them at OSU. Advisement in University Academic Services is also directed toward assisting students in meeting the University's General Education requirements for all students pursuing a baccalaureate degree. UAS 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 placed on probation due to academic difficulty, yet recommended by their academic college to UAAP on a probationary basis. UAAP gives students an opportunity to re-evaluate their career and educational alternatives.

In addition to the teaching, academic advising and counseling functions of UAS, 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 University Academic Services.

Computer Center

The University Computer Center (UCC) 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 University Computer Center office is located in Math Science 113. In addition, the UCC has remote facilities for general use, consisting of computer terminals and printers located in Agricultural Hall 241, Business 009, Engineering South 113, Math Science 108 and Parker Hall basement. The terminal rooms are open the same hours as the buildings.

A UCC microcomputer lab with IBM and Apple Macintosh microcomputers is located in room 020 of the Classroom Building. These microcomputers are equipped with Microsoft Word, Systat, and several other software packages. Students may use this software or bring their own. Lab monitors are always available to help with the equipment. The lab is open for extended hours during the week and limited hours on the weekends.

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 20-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 levels of mathematics courses through calculus. There are also five Caramate audiovisual units for studying audio tapes and slide presentations.

Graduate and undergraduate students majoring 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 hourly 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 group insurance policy.

The Center is open from 8:00 am. 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 in honor of Maude Gardiner, 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 active artists 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 library is used daily by students and faculty from various disciplines. Visitors to the library have included home builders, architects, interior designers, professionals who work with handicapped and elder 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 University 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 recreation programs. Activity areas available include racquetball, indoor and outdoor swimming, gymnastics, fencing, billiards, dance, golf, table tennis, wrestling, weight-lifting, volleyball, badminton and squash. Intramural programs are conducted for women, men and co-rec (coed) teams.

Outdoor facilities available for student recreational 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, Edmon Low Library contains nearly 1,500,000 volumes and over 15,000 serials 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 to accommodate study for final examinations at the end of the fall and spring semesters. Guides to the use of the Library are available inside the main entrances and adjacent to the various reference desks throughout the building.

Arrangement of the Collections is in broad subject areas (humanities, sciences and engineering, and social sciences) which are based upon the Dewey Decimal Classification System and a number of special areas which house unique kinds of materials. With some exceptions, access to the materials is primarily through the card catalog located adjacent to the Catalog Assistance and Information Desk on the second floor.

Interlibrary Loan. Located adjacent to the Catalog Assistance and Information Desk on the second floor, this area provides access to needed materials that are not available in the OSU Library. Requests may be placed at any area reference desk. All borrowing of material is conducted within the provisions of the Oklahoma Interlibrary Loan Code and the National Interlibrary Loan Code of the American Library Association. To provide faster response to requests, courier service between the libraries at the University of Oklahoma, University of Oklahoma Health Sciences Center, OSU-Oklahoma City, College of Osteopathic Medicine-OSU, the University Center at Tulsa, the University of Tulsa, and the Oklahoma Department of Libraries is used Monday through Friday. The Library also uses facsimile machines (FAX) as needed to send interlibrary loan requests and to receive copies of some articles.

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 documents area is a regional 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.

Patent and Economic Development (PED) Department. The Library was designated as a U.S. Patent Depository in 1956 and is a much used resource for inventors, attorneys and businesses throughout the state. Patent searching is available by appointment from 8:00 a.m. to 5:00 p.m., Monday through Friday, and some Saturday appointments may be arranged. There is no charge for the assistance provided in searching the patent collection. The PED librarian also is available to discuss the patent collection and the patenting process with classes and other interested groups. The office is located in the southwest corner of the basement.

Maps. The Map Room houses one of the largest and most comprehensive collections of maps in the state. This collection contains more than 165,000 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 three million microforms 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, such as Landmarks of Science, Early American Imprints, Early English Books, U.S. Patents, and Western Americana, as well as video cassettes, slide/tape programs, and taped lectures.

Special Collections and University Archives. Located on the third floor, and open from 8:00 a.m. - 5:00 p.m. on Monday through Friday, the Library's Special Collections consist of rare books, selected material on Oklahoma history, and several manuscript collections. The collecting focus is on Oklahoma politics and agriculture, as well as journalism and natural resources. Among these collections are Oklahoma historian Angie Debo's books and papers; papers from the files of Paul Miller, the noted newspaperman; fine first editions of 19th and early 20th century British and American authors which were collected by Henry G. Bennett; the papers of Henry S. Johnston, former governor of Oklahoma; and the Fin nell and McBride Collections on soil conservation and water resources. The University Archives houses official records and other material which depict the development of Oklahoma State University. In addition to records which must be retained permanently, the Archives contains publications of the agricultural and engineering experiment stations; published faculty and departmental research; OSU theses and dissertations, campus photographs dating back to 1890; and papers from the Scott, Bennett, and Willham administrations. Material housed in this area must be used in the adjacent reading room.

Computer-assisted Searching. CD-ROM products are available in various departments of the
Edmon Low Library and may be accessed directly by users. The 15 databases currently operational cover articles, newspapers, dissertations, and monographs from a wide variety of disciplines. Persons seeking information on a topic merely go to a work station on which an appropriate CD-ROM database is loaded and using easy search procedures type in the request using key words or terms. Bibliographic citations retrieved are displayed on the monitor. The search can be modified as necessary and the results printed.

**ON-LINE** provides direct access to a number of remote databases. Persons who wish to arrange for a search should contact a reference librarian regarding an appointment for the search. The Library will absorb all staff costs involved in the search.

**SAILS (Swets Automated Independent Library System)** is the name given to the Library's in-house, on-line system which is under development. When fully operational, the system will include an on-line catalog, computer control for the acquisitions and serial records, and automated circulation functions. The system is available in a limited public test mode during the 1990 calendar year.

**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 has exhibits relating to OSU's early history, and some rooms have been recreated 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, normally at no 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 the facility and is equipped with two independent, fully operational studios with a capacity of eight cameras. A third studio is a self-contained, instructor-controlled, classroom-style studio for videotaping courses. 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 using a Ku-band satellite truck from remote locations. ETS produces over 1400 live and tape programs per year consisting of video telecourses, 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 30 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 entrance to employment at ETS. One method is through an internship which allows the student to earn college credit. Another method is through part-time employment. ETS employs those students who have completed an internship, and the third is through the University's work-study program.

**Wellness Center**

The OSU Wellness Center will open in 1990. The Center will offer programs to all students; full-time faculty and staff will be served on a pay-per-service basis. Some of the programs to be included are wellness screening (cholesterol, blood pressure, body composition, and computerized health appraisal), wellness education classes, certification of aerobics and weight training instructors, and campus-wide health promotion activities. The Wellness Center will feature a 141-seat theater, aerobics room, weight training room, and demonstration kitchen. These rooms may be used for OSU-sponsored programs, in cooperation with the Wellness Center.

**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.

Campus Recreation

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. Special 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 Recreation 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.

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. Two films each month are presented, as single showings or as a series. 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 as well as single above. 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.

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; and 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 popular places to live on the OSU campus. The housing and food service programs have 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 governments, 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 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. The RHA counts the elected officers of each hall in the process of (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 climate of the 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.
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 Seretean 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.

OSU Foundation

Established in 1961 as an independent, private, non-profit corporation, the OSU Foundation is the official fund-raising organization for Oklahoma State University. The Foundation's mission is to generate, and prudently manage and disburse funds raised for a wide variety of programs, including scholarships, fellowships, endowed faculty positions, the library, varsity athletics and capital improvement projects.

Private funds raised by the OSU Foundation enable Oklahoma State University to obtain the necessary resources vital in maintaining educational excellence.

OSU-Oklahoma City

The curricula are designed to prepare students for a variety of positions in business, government and industry. Specialized technical courses enable graduates to understand the underlying purposes of the operations and functions for which they are responsible and to utilize basic scientific principles in developing ideas. General courses in communication skills, personal development, and social and economic principles broaden the student's interests and aid them in the further development of their abilities.

OSU-Oklahoma City is located at the crossroads of Oklahoma City, Interstate 44 and Interstate 40, at 900 North Portland, Oklahoma City, Oklahoma 73107.
to computer applications as an enhancement to their educational studies. OSU-Okmulgee serves the educational needs of students seeking exciting and rewarding careers in business and industry. These students want an education that is of sufficient breadth and depth to enable them to enter the world of business and industry with highly marketable skills, and provide a pathway for career advancement. OSU-Okmulgee graduates are employed throughout Oklahoma, the nation and the world in fields ranging from high tech and manual arts to business and fine arts.

OSU-Okmulgee operates year round on the trimester system—three 15-week sessions per year. Classes begin in early January, late April and late August.

Major instructional departments include air conditioning and refrigeration technology, automotive technology, business and office occupations, computer information systems, construction technology, diesel and heavy equipment technology, electrical and electronics technology, engineering graphics technology, hospitality services technology, manufacturing technology, small business occupations, and visual communications.

OSU-Okmulgee’s academic programs are complemented by outstanding educational facilities. Labs feature state of the art instructional equipment.

Nationwide attention is being focused upon the college’s Noble Center for Advancing Technology. This facility houses many computer-intensive technologies, including information processing, microelectronics and automated manufacturing. OSU-Okmulgee is located at 1801 East Fourth Street, Okmulgee, Oklahoma 74447-3901.

University Academic Regulations

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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 adviser.

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. For continued enrollment in an undergraduate program, a student must have earned a cumulative grade-point average as indicated below:

<table>
<thead>
<tr>
<th>Total hours</th>
<th>Minimum grade-point average required</th>
</tr>
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<tbody>
<tr>
<td>24 through 36</td>
<td>1.60</td>
</tr>
<tr>
<td>37 through 72</td>
<td>1.80</td>
</tr>
<tr>
<td>73 or more</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Any student not maintaining progress toward his or her educational objectives as indicated above will be placed on probation for one semester. At the end of that semester, he or she must have a semester GPA of 2.00 or meet the minimum standard required above, in order to continue as a student.

A senior who has failed to meet the cumulative grade-point average of 2.00 may enroll in an additional 15 semester hours in further attempt to achieve the graduation requirements. All courses in which a student has received a recorded grade will be counted in the calculation of the grade-point average for retention purposes.

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 on probation will be suspended when he or she earns a grade-point average of less than a 2.00 grade-point average over the last semester attempted and the cumulative grade-point average for all hours attempted falls below the following:

Total hours Minimum grade-point average required
24 through 36 1.60
37 through 72 1.80
73 or more 2.00

A senior who has failed to meet the cumulative grade-point average of 2.00 may enroll in an additional 15 semester hours in further attempt to achieve the requirements for graduation. All courses in which a student has received a recorded grade will be counted in the calculation of the grade-point average for retention purposes.

1.8 Reinstatement after Academic Suspension. A student who has been suspended from the University for academic reasons may not...
ordinary to be readmitted sooner than one year from the date of suspension; readmission will be considered on the merits of the individual case.

### 1.9 Readmission

Students who have attended OSU but were not enrolled during the immediate semester following admission may apply 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 academic adviser and dean and the approval of the Office of the Vice-President for Academic Affairs and Research.

A student who withdraws prior to the end of the sixth week of a regular semester or the third week of a summer session will receive a grade of "W" (withdrawn). 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 "W" (withdrawn passing) or "WF" (withdrawn 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 who withdraws during the fall or spring semester shall be assigned only the grade of "A," "B," "C," "D," or "F" (when appropriate) "I," "NP," "P," or "R" by the instructor of each course at the end of the summer or semester 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 semester students who are enrolled in 12 or more semester credit hours are classified as "full-time" students. 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. Students attending an internship or cooperative education program assignment who are approved by the Office of the Vice-President for Academic Affairs and Research may be classified as full-time students if enrolled in less than nine hours during the semester in which the degree will be conferred. If the dissertation, thesis, report, or creative component is the only item left to complete the plan of study, the student is designated as being enrolled full-time upon the approval of the department head and dean of the Graduate College.

#### 2.3 Part-time Students

Students who are enrolled but not meeting the definition of full-time status will be considered "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 for a degree, 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 a given 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 withdraws from OSU, changes in the requirements that were in effect when the student was last classified as a full-time student are made. 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 minimums for general education established by the University, which are: (a) 40 semester credit hours, and 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), and three semester credit hours of American government (POLSC 1013), and, in addition, at least three semester credit hours in each of the following areas: Abstract and Quantitative Thought, Humanities, Natural Sciences, and Social and Behavioral Science. At least 15 of the 34 semester credit hours must be in disciplines not directly supportive of the student’s major field of study.

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 international dimension, and a course in the Natural Sciences, Physical Sciences, Geoscience, or Astronomy) must be satisfied in any course other than the student’s major department.

A student who does not complete the degree by the normal semester (fall or spring semester), and four hours of enrollment for the summer semester in order for the student to be classified as a full-time student.

A student enrolled for the final semester of a bachelor’s degree program may be classified as a full-time student if enrolled in less than 12 hours during that semester.

A student in the terminal phase of the plan of study, including the final year’s or doctoral degree, may be classified as a full-time student if enrolled in less than nine hours during the semester in which the degree will be conferred. If the dissertation, thesis, report, or creative component is the only item left to complete the plan of study, the student is designated as being enrolled full-time upon the approval of the department head and dean of the Graduate College.

#### 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 or 1213. Students on probation, or not on track to graduate, may not earn three semester credit hours in English composition by advanced standing examination. Students who earn three semester credit hours in English composition by advanced standing examinations must provide a transcript of all work taken elsewhere. Admissions to any college may be declared after one year from the date of suspension; readmission will be considered on the merits of the individual case.

#### 3.6 English Essay Proficiency Examination

All candidates for a baccalaureate degree at OSU must pass the University English Essay Proficiency Examination. Students are required to take the examination no later than the first semester of their junior year. The Department of English administers the examination in special group sessions; for a small fee, it may also be taken by appointment at the University Testing and Evaluation Service. Registration for the examination is in the Office of Student Academic Services of each college. Only students who present registration cards will be permitted to take the examination. Students who fail the examination, no later than the first semester of their junior year, will receive the grade of "W," "H," "N," or "S" which have been designed especially to provide general education experiences to students outside their major field and marked with SpD.

#### 3.7 Substitution of Required Courses

In meeting degree requirements a lower-division course may not be substituted for an upper-division course requirement. Substitution policy is governed by the individual colleges.

#### 3.8 Waiving of Required Courses

A maximum of six semester credit hours may be waived. Required courses in English, American history, and American government cannot be waived. A student who completes a minimum of six semester credit hours required for the degree cannot be reduced. Waive cards must be signed by the student’s adviser, the head of the student’s major department and the dean of the college.

#### 3.9 Changing Majors

Students are advised to select a specific major no later than the end of the sophomore year. Students who are not on track to graduate, or making unsatisfactory progress toward a degree, may change majors only with the approval of the dean of the college in which they wish to pursue a different degree.

#### 3.10 Deadline for Completion of Requirements

Degrees are conferred only on specific commencement dates. If a student completes requirements for a degree after a common
Credit will be recorded with a grade of "P" if the student earns a "C" or better on the examination. In order to qualify for an advanced standing examination, the student must:
(a) be enrolled at OSU;
(b) need 15 or 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 other advanced standing credit hours. (See "Residence Requirements");
(c) need the course to meet some requirement for a certificate or degree that is being pursued;
(d) not have taken an examination over the course within the preceding six months;
(e) have the recommendation of the Office of the Registrar and the approval of the head of the department in which the course is offered.

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. The Independent and Correspondence Study Center at Tulsa.)

A student who receives a baccalaureate degree from OSU may use all applicable courses toward a second 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 completed at 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 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 a degree. Credit will be accepted, toward a degree, only to the extent that they would apply had they been earned in residence at OSU. Students may not use transfer credits to satisfy more than one-half the major coursework in 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. Within 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 course work, either academic or non-academic, employed by transfer of work, professional 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 residence at OSU, may apply for an examination on the subject.

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 work was done 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) have the necessary evidence to prove that the student has taken the course;
(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) pass only one such examination in each subject.

The student secures the forms for the examination at the Office of the Registrar and Admissions. The request must be made before the end of the fifth week of class instruction of a regular semester or the second week of a summer session. Such credit may be earned under the following conditions:
(a) the student has taken the course;
(b) the student has taken the course at an accredited institution that requires an examination for validation purposes, and the student has taken the test at the same institution;
(c) the student has taken the course at an accredited institution that requires an examination for validation purposes, and the student has taken the test at an institution that is not required to have an examination for validation; or
(d) the student has taken the course at an institution that is not required to have an examination for validation, and the student has taken the test at an institution that is required to have an examination for validation.

The result is reported to the Office of the Registrar and Admissions when the "P" grade is recorded if the examination result is "C" or above.

4.8 Graduate Credit Hours for a Senior. A senior is a student who is graduating from OSU at the end of a semester or 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 end of the fifth week of class instruction of a regular semester or the second week of a summer session. Such credit may be earned under the following conditions:
(a) the student has taken the course;
(b) the course was not taken at OSU, and if the student was not accredited, may apply for a validation examination.

The result is reported to the Office of the Registrar and Admissions when the "P" grade is recorded if the examination result is "C" or above.

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- or 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. Enrollment

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 as to student classification; 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 numbered 1123 should be interpreted as a freshman, or beginning, level course carrying one semester credit. A course number beginning 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 50 percent greater than the number of weeks in the applicable academic semester or summer session.

5.3 Adding Courses. Approval of the student's academic adviser is required for adding a course. The sixth class day of a regular semester or the third class day of a 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 second week of a regular semester or the first week of a 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 deadline for dropping with no record, 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 "WF" (dropped). After the sixth week of a regular semester or the third week of a summer session but prior to the end of the 10th week of a regular semester or the fifth week of a summer session, a student may drop a course with the grade of "WF" (dropped failing) as assigned by the instructor. The grade of "WF" will be calculated in the grade-point average.

5.5 Concurrent Enrollment. 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 Support) examinations while enrolled for credit at OSU, 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 the student's request as a period of time in which the student's dean will review eligibility. After this period, a decision will be made, and the student will be notified.

5.6 Prerequisites to Upper-division and Graduate-division Courses. When no prerequisites are listed for courses numbered 5000 or 6000, 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 2.000.

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. Certain groups of students are extended the option of enrolling prior to the time continuing students begin enrolling. Physically handicapped students are extended the option of priority enrollment. Those students actively participating in the University Honors Program 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 enrolling. Scholarships that qualify students for priority in enrolling in trial semesters are University band, athletic, and graduate teaching assistantships for teaching or research assignments. Wentz scholars are also extended the option of priority enrollment. (These are not to be considered inclusive, but the scholarship 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 Enrollment. A student is permitted to enroll during the first week of a semester, provided he or she brings his or her fee payment to the University office on the first day of a summer short course. A student enrolling late 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.

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 5:00 p.m. on the 15th day of each month following billing. All delinquent accounts in excess of $100 will be referred to a collection service and a penalty at the rate of 1 1/2 percent per month. Accounts must be cleared before the student can obtain the release of any records, obtain a transcript, receive a diploma, or enroll at OSU for subsequent semesters.

5.11 Audit. A student who does not wish to receive credit for 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. The audit form is available in the Office of the Registrar. (Laboratory courses, private music lessons and art courses are not open for audit.)

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. Copies of transcripts from other institutions cannot be furnished.

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, NP, P, R, W, WP, and WF.

Mark of "AU." An "AU" indicates that the student completes the course work. The quality of student performance 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" does not mean 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.

Grade "A" yields 4 grade points per semester credit hour.
Grade "B" yields 3 grade points per semester credit hour.
Grade "C" yields 2 grade points per semester credit hour.
Grade "D" yields 1 grade point per semester credit hour.

Grades "F", "I", "NP", "P", "R", "W", "WP" and "WF" yield 0 grade points per semester credit hour.

6.4 Grade-point Average Calculation. 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 the mark of "N" will not affect the overall grade-point average.

6.5 Freshman Progress Reports. The faculty will report grades for all freshmen on the dates as printed in the official University calendar. The date will normally be Friday of the eighth week of classes. Progress reports are made available to freshmen students shortly after mid-semester. Copies are made available to the students' advisers and the students' deans.

6.6 Pass-No Pass Grading System. An undergraduate student may elect to take no more than four courses or 15 hours (whichever is greater) during his or her academic career with the pass-no pass grading option. The option is restricted to those students who (a) have passed 28 or more semester credit hours, (b) have at least a 2.5 grade-point average in all hours attempted, (c) have met all of the prerequisites for enrollment in the pass-no pass option, (d) have need of the course in question for meeting any requirements for graduation or certification other than as a general (unrestricted) elective, and (e) have the approval of their academic adviser.

A student who chooses the pass-no pass option must do so by the last date on which a course may be added. Once the deadline has passed a student cannot switch from the regular choice or the pass-no pass grading systems. The pass-no pass option is not identified on the official class roll and thus is not known to the instructor. The instructor assigns a normal grade based on the work performed.

The grades of "A," "B," and "C" are recorded on the transcript as "P"; the grades of "D," "F," and "WF" are recorded as "NP." "W," "WP" and "I" grades will be recorded without change. The pass-no pass grade will not affect the grade-point average.

Graduate students may enroll to take a course by the pass-no pass option. A course so taken cannot be used to meet graduate degree requirements.

6.7 Pass-Fail Grading System. Some courses are taught only on a pass-fail basis. Such courses are so 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." Students who pass the course are recorded as earning the grade of "P." Those who fail the course are recorded as earning the grade of "F." The final grade earned will be recorded in the Office of the Registrar. Students who earn a grade of "P" are so designated in the "Course Listings" section of the Catalog.

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

6.9 Correcting Grades Reported in Error. An instructor who reports an incorrect grade to the Office of the Registrar may request that Office to correct the grade. The request must be in writing and must have both the department head's and the dean's approvals. In no case will a grade be lowered after the student has been graduated.

6.10 Grade Appeals. A student may appeal a grade given by an instructor in cases in which he or she believes the grade awarded is inconsistent with the announced grading policy. (See Student Rights and Responsibilities pamphlet or contact the Office of the Vice-President for Academic Affairs and Research.)

6.11 Honor Rolls. Undergraduate students completing all enrolled hours (not less than 12 semester credit hours in a regular semester or six in a summer session) with an overall (not cumulative) grade-point average of 3.20 or higher, and with no grade of "I" or "W" in any course and no grade lower than a "C" are placed on the Dean's List of Distinguished Students. Students who have completed their courses under the same requirements as outlined above, with a grade-point average of 4.00 (i.e., all "A's") are placed on the President's List of Distinguished Students. The grade-point average calculated through correspondence may not be included in meeting the minimum enrollment required for grade-point average required for an honor roll.

6.12 Academic Dishonesty or Misconduct. Academic dishonesty or misconduct is not condoned nor tolerated at Oklahoma State University. Academic dishonesty is behavior in which a deliberately fraudulent misrepresentation is employed in an attempt to gain undeserved intellectual credit, either for oneself or for another. Academic misconduct is behavior that results in intellectual advantage obtained by violating specific directions, rules, or accepted academic standards, but without deliberate intent or use of fraudulent means. (See also Policy and Procedure Letters.)

7. Graduation

7.1 Graduation Requirements. The responsibility for satisfying all requirements for a degree rests with the student. Graduation must be taken in residence at this institution. Under special circumstances, permission may be given to allow three of the last 18 hours to be taken out of residence. Including the last 18 semester credit hours the student must have earned a total of not less than 30 semester credit hours at OSU taken in not less than two semesters, or one semester and one summer session, or three summer sessions. Courses taken as part of a required internship, such as in medical technology, may not be used in meeting this requirement. In the College of Business Administration the last 30 hours must be earned in residence.

7.2 Residence Requirements. A minimum of one-half of the upper division requirements in a student's major field must be earned in residence at OSU. (See "College Enrollment Requirement.") The last 18 hours completed by a student immediately prior to graduation must be taken in residence at this institution. Under special circumstances, permission may be given to allow three of the last 18 hours to be taken out of residence. Including the last 18 semester credit hours the student must have earned a total of not less than 30 semester credit hours at OSU taken in not less than two semesters, or one semester and one summer session, or three summer sessions. Courses taken as part of a required internship, such as in medical technology, may not be used in meeting this requirement. In the College of Business Administration the last 30 hours must be earned in residence.

7.3 College Enrollment Requirement. A candidate for graduation must be enrolled in the college from which he or she wishes to receive the degree for at least two semesters, or one semester and one summer session, or three summer sessions immediately preceding graduation. For the award of a second baccalaureate degree, this requirement may be waived by the dean of the college awarding the second degree. (See "Residence Requirements" and "Second Baccalaureate Degree.")

7.4 Residence Waiver for Certain Premedical Students. Students who complete at least 94 semester credit hours in a recognized premedical science program and then transfer to a professional program leading to the doctoral degree at an accredited professional school of medicine, osteopathic medicine, veterinary medicine, dentistry or optometry will be awarded the appropriate baccalaureate degree upon the successful completion of 30 semester credit hours in basic medical science courses applicable to the OSU major. This option is available only to students who have completed all other degree requirements for the major and have taken at least the last 30 semester credit hours of work at OSU prior to transferring to a professional school. (See "Residence Requirements.")

7.5 Minimum Hours for Graduation. Each degree program requires a specific minimum number of semester credit hours for graduation, as indicated in the Catalog. No degree program shall require fewer than 120 semester credit hours for graduation. No student shall be permitted to graduate having completed fewer total hours than the requirement specified for that degree. At least 40 hours of upper-division course work shall be required in every baccalaureate degree program.

7.6 Grade-point Average for Graduation. A cumulative grade-point average of 2.00 or higher is required for graduation. (See "Grade-point Average Calculating.") A cumulative grade-point average of 2.00 or higher must also be earned for the specified hours on the degree requirement sheet (including any electives), in addition to the 2.00 or higher grade-point average required by the department in the major or minor fields.

7.7 Payment of Graduation Fees. The graduation fee is due at the same time that tuition is due. Information on procedures and deadlines is given to students at the time they complete their enrollment.

7.8 Requirements for Honors Degrees. The individual colleges have specific requirements for degrees with honors. Students should consult the office of their academic dean for information. (See "Honors Programs" in the Catalog.)

7.9 Diploma Application. Each candidate for graduation shall file a diploma application in the Office of the Registrar within two weeks following enrollment in a regular semester or one week in a summer session in which the student wishes to be graduated.
7.10 Presence at Commencement Exercises. The University will hold one Commencement exercise each year at the close of the spring semester. Students who meet the graduation requirements the preceding fall semester and students who plan 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. Absentia 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:

That this 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.

The following, while not intended to be exclusive, illustrates the offenses encompassed herein: occupation of any University building or part thereof with intent to deprive others of its use; blocking the entrance or exit of any University building or corridor or room therein; setting fire to or by any other means substantially damaging any University building or property, or the property of others on University premises; any possession or display of or attempt to threat to use or use of firearms, explosives, other weapons or destructive means or devices, except as necessary for law enforcement, in any University building or on the University campus; prevention of the convening, continuation or orderly conduct of any University class or activity or of any lawful meeting or assembly in any University building or on the University campus; inciting or organizing attempts to prevent student attendance at classes; and, interfering with or blocking normal pedestrian or vehicular traffic on the University campus.

C. Responsibility of the President

When it appears that there is a violation of Section 1-A or 1-B, it shall be the duty of the president (and he is fully authorized to act) to take all steps which the president deems advisable to protect the assumed and designated interests of Oklahoma State University and to see that its rules, regulations and policies are enforced. The president shall assure that any person or persons found guilty after proper hearing shall be disciplined in accordance with the existing Oklahoma State University student disciplinary regulations.

In carrying out these duties, the president may call upon any member of the University administration, or any member of the faculty, and the president may call upon any agency of the University created to deal with cases arising under Section A. Action by any state or federal court shall not preclude the University from exercising its disciplinary authority.

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 by the president be 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.

Degree Programs Offered

The type of degree offered in each major is listed along with an indication of the college(s) in which each may be earned. (Some majors are offered with more than one type of degree, e.g., Bachelor of Arts and Bachelor of Science. Many have options within the major. See the department narrative for details.)

B Bachelor's
M Master's
D Doctor's
S Specialist

Ag Agriculture
A&S Arts and Sciences
Bus Business Administration
Ed Education
En Engineering
HE Home Economics
Gr Graduate College
CM College of Medicine
T Technology
VM Veterinary Medicine

Accounting (B,M) Bus/Gr
Aerospace Studies (B) A&S
Agricultural Communications (B) Ag
Agricultural Economics (B,M,D) Ag/Gr
Agricultural Education (B,M,D) Ag/Gr
Agricultural Engineering (B,M,D) En/Gr
Agriculture (M) Gr
Agronomy (B,M) Ag/Gr
Crop Science (D) Gr
Soil Science (D) Gr
Animal Science (B,M) Ag/Gr
Animal Breeding (D) Gr
Animal Nutrition (D) Gr
Dairy Science (M) Gr
Poultry Science (M) Gr
Applied Behavioral Studies (M,D) Gr
Applied Mathematics (M) Gr
Architectural Engineering (B,M) En/Gr
Architecture (B,M) En/Gr
Art (B) A&S
Aviation Science (B) Ed
Aerospace Engineering (B,M,D) Ag/A&S/Gr
Biological Science (B) A&S
Botany (B,M,D) A&S/Gr
Business Administration (M,D) Gr
Chemical Engineering (B,M,D) En/Gr
Chemistry (B,M,D) A&S/Gr
Civil Engineering (B,M,D) En/Gr
Clothing, Textiles and Merchandising (B,M) HE/Gr
Computing and Information Science (B,M,D) A&S/Gr
Construction Management Technology (B) T
Corrections (M) Gr
Counseling and Student Personnel (M,D,S) Gr
Curriculum and Instruction (M,D,S) Gr
Distributive Education (M) Gr
Economics (B,M,D) A&S/Bus/Gr
Education
Elementary Education (B) Ed
Secondary Education (B) Ed
Special Education (B) Ed
Educational Administration (M,D,S) Gr
Electrical Engineering (B,M,D) En/Gr
Electronics Technology (B) T
English (B,M,D) A&S/Gr
Entomology (B,M) Ag/Gr
Environmental Engineering (M) Gr
Environmental Science (M,D) Gr
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

Oklahoma State University
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
Mass Communications (M) Gr
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
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
Occupational and Adult Education (M,D,S) Gr
Osteopathic Medicine (DO) OM
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
Sociology (B,M,D) A&S/Gr
Speech (B,M) A&S/Gr
Speech Pathology (B) A&S
Statistics (B,M,D) A&S/Gr
Technical Education (B,M) Ed/Gr
Theater (B) A&S
Trade and Industrial Education (B,M) Ed/Gr
University Studies (B) All colleges
Veterinary Medicine (DVM) VM
Veterinary Parasitology (M,D) Gr
Veterinary Pathology (M,D) Gr
Wildlife and Fisheries Ecology (B,M,D) A&S/Gr
Zoology (B,M,D) A&S/Gr

Summary of degrees offered:
Bachelor's 85
Master's 69
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 work force. 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 12 major fields of study. Plans of study that emphasize production, science, business or other specific areas of specialization are provided in the various departments.

Accreditation

Agriculture is a broad and diverse profession and does not have a single accrediting society as do some other professions. Programs in forestry and agricultural education are accredited by their profession. In addition, each department’s program is reviewed at least once every five years by a panel of scientists and other professionals with national or international reputation for excellence in that respective discipline.

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 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 academic 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 $215,000 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 for new students may also be obtained from local high schools and county cooperative extension service offices. Applications are available beginning December 1.

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 a 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 1213; ENGL 2333 (or 3323).
Chemistry (17 hours minimum):
1. General chemistry (8 hours minimum): CHEM 1314 and 1515 or 1225; (or 1215 and 1225).
2. Organic chemistry (5 hours minimum): CHEM 3015 (or 3053, 3153, and lab).
1. Physics (8 hours minimum): PHYS 1114 and 1214.
2. Mathematics (3 hours minimum): MATH 1513 (or any higher level mathematics).

Biological science (15 hours minimum). Courses must cover botany, genetics, microbiology and zoology. Each course, except genetics, must include laboratory work.

3. Genetics: (ANSI 3423 or AGRON 3554 or BISC 3024.)

Although these course requirements may be completed within two years, most pre-veterinary medicine students complete at least three years of preparatory course work or a bachelor’s degree. For information as to required tests and application procedures, refer to the “College of Veterinary Medicine” section in this Catalog and the current Veterinary Medicine at Oklahoma State University brochure. Students are also encouraged to contact the assistant dean for resident instruction in the College of Agriculture.

Pre-veterinary Science Degree. A Bachelor of Science degree in Agriculture with a major in pre-veterinary science may be obtained after the completion of one year in the College of Veterinary Medicine. General education and other requirements for graduation in the College of Agriculture must be met. Specific plans of study
may be obtained from the Office of the Assistant Dean of Instruction, 136 Agriculture Hall.

General Education Requirements

The College of Agriculture is committed to providing graduates both a depth of knowledge in their chosen field of study as well as breadth of knowledge outside their major. General education requirements are the same as those of the general University. Specific course offerings are given in the respective plans of study.

Graduation Requirements

General University requirements for graduation are stated elsewhere in this Catalog. In addition, specific requirements must be met for the Bachelor of Science and Bachelor of Landscape Architecture degrees in Agriculture. For the Bachelor of Science degree, a total of 130 semester credit hours must be completed satisfactorily in all departments except agricultural education, biochemistry and forestry. Agricultural education (teaching option) requires 133 credit hours; biochemistry requires 124 credit hours; and forestry requires 140 credit hours. The Bachelor of Landscape Architecture is a five-year program requiring 160 credit hours. A minimum of 40 semester credit hours and 100 grade-points must be earned in courses numbered 3000 or above.

Departmental Clubs and Honor Societies

Ag Communicators of Tomorrow
Aggie-X Club (agricultural economics)
Agriculture Ambassadors
Agriculture Student Council
Agronomy Club
Alpha Tau Alpha (agricultural education)
Alpha Zeta (College of Agriculture honor society)
American Chemical Society
American Society of Landscape Architects
Associated Landscape Contractors of America
Block and Bridle Club (animal science)
Collegiate 4-H
Collegiate FFA
Dairy Science Club
Food Industry Club
Forestry Club
Horticulture Club
National Agri-marketing Association
OSU Horsemans Association
Pre-veterinary Medicine Club
Rodeo Association
Sanborn Entomology Club
Sigma Lambda Alpha (horticulture and landscape architecture)
Society for Range Management
Soil Conservation Society
Xi Sigma Pi (forestry honor society)

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 newswriting 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.

Agricultural Economics

Professor and Head James E. Osborn, Ph.D.

Agricultural economics provides professional opportunities for students interested in solving problems in agricultural production and agribusiness, as well as solving problems in the broader areas of resource development, environmental planning, recreation, public policy and agricultural law.

Agricultural economics combines instruction in the agricultural sciences with education in the application of business and economic principles and tools to the science and art of private and public decision-making. Emphasis is placed on the management of agricultural production and marketing firms and upon decision-making and problem-solving guides relevant to public policy decisions.

Careers of agricultural economists reflect the broad base of the educational program, particularly as related to management. Careers in production and marketing include self-employment as farmers or ranchers, and managers of agribusiness marketing firms such as processors, manufacturers and distributors of food products, chemicals and machinery. Other careers include employment by consulting firms, educational institutions and financial agencies in private and governmental research and service activities.

Major areas of course work in agricultural economics include farm management, agricultural marketing, agricultural financial management, resource conservation and development, agricultural prices, agricultural policy and land appraisal. Courses in economic theory, statistics, computer sciences, mathematics and technical agriculture provide additional depth and breadth to the curriculum. An intensive advisement program and a broad range of elective courses permit the student to structure a program consistent with his personal interests, objectives and needs.

Eleven degree options or specialties are available to students majoring in agricultural economics: farm and ranch management, marketing and business, general, science, pre-law, pre-veterinary business management, international agricultural marketing, and rural development and natural resources with two additional options offering double majors in agricultural economics and accounting, in agricultural economics and computer science, and agricultural economics and agricultural education.

Graduate Programs

The Department offers graduate work leading to the Master of Science, the Master of Agriculture and the Doctor of Philosophy degrees. Both thesis and non-thesis options are available at the M.S. level. Ph.D. students complete a teaching practicum in addition to the research thesis as a part of the degree requirements.

The graduate program stresses development of superior professional competence suited to the demands of the modern business, academic, government and research environments. Advanced courses concentrate on economic analysis applied to problems of production, distribution and consumption of agricultural products. 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,
admission, but will not count toward a graduate
tain cases, a part of this work can be taken after
theory, constitute a minimum background for
Ahmed to assure that background or prerequisite work
achieved through course electives and research
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 commit-
tee 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 agricultural economics are
(1) the desire to understand and solve the com-
plex and changing economic problems faced by
agriculture and rural society, and (2) the desire
and ability to learn methods of rigorous logical analysis.
In addition, differential calculus, three semester
hours of statistical methods and 15 semester hours of
agricultural economics and economics, including intermediate micro- and macroeconomic
theory, constitute a minimum background for
advanced study in agricultural economics. In cer-
tain cases, a part of this work can be taken after
admission, but will not count toward a graduate
degree.
Acceptance by an advisor in the Department
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 Depart-
ment of Agricultural Education is designed to pro-
vide 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 con-
sultants with agribusiness 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 Agricultural Education
Teaching License. This license is recognized as
meeting requirements for initial employment as a
teacher in most other states. The professional ser-
vice option is designed to focus on careers relating
to education and service in agriculture, but out-
side 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 educa-
tion 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 profes-
sional 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 educa-
tional careers in agriculture, agribusiness, govern-
ment 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 institu-
tion. 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.
Students working toward 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.

An alternative is the Master of Agriculture in
the emphasis area of agricultural education. The
credit hours required of 5000-level courses, educa-
tion courses, and specialization courses are the
same as for the Master of Science degree. Three
options are available: (1) a 32-hour option which
includes a formal research report; (2) a 36-hour
option which includes a creative component; and
(3) a 36-hour option which includes a professional
internship.

The Doctor of Education degree with a major
in agricultural education is offered by the Depart-
ment of Agricultural Education as a member of the
Teacher Education Group V of the Graduate
Faculty. A minimum of 20 hours must be com-
pleted in agricultural education, education, and
psychology. In addition, at least 20 semester hours
must be completed in an area of specialization
such as agricultural extension, technical
agriculture, educational administration, curriculm
development, adult education, or behavioral
sciences. Ten hours of credit will be earned for
the completion of a thesis. The remaining ten hours
of course work within the 60-hour total requirement
may be selected as free electives. Applicants for
admission to the doctoral program must have at
least three years of successful agricultural educa-
tion teaching or similar professional experience.
In addition to the above programs, the Depart-
ment also cooperates with the School of Occupa-
tional and Adult Education area at the specialist
and doctoral levels.

Agricultural Engineering
Professor and Head David R. Thompson,
Ph.D.
The Department of Agricultural Engineering is
administered jointly by the College of Agriculture
and the College of Engineering, Architecture and
Technology.

Agricultural engineers are professional people
who generate and adapt engineering knowledge
and technologies for the efficient and effective pro-
duction, processing, storage, handling and dis-
bution 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
Agriculture or College of Engineering, Architec-
ture 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 Engineering, Architecture and
Technology by the end of their first semester.

Agricultural engineering students study engineer-
ing, physical, mathematical, biological and
agricultural sciences. Agricultural engineering
courses apply mathematics, basic engineering
and science to create and design new systems
and equipment for agricultural and biological
production and processing. Social studies and
humane studies prepare students to work with people;
these studies are important because the
agricultural engineer early in his or her career
assumes supervisory and management responsi-
bilities. Computer use is emphasized for simula-
tion, 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 engineer-
ing 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,
instrument and controls for farming and ranching,
food processing and packaging, and production of
biotechnology products; and systems for effi-
cient production, processing, handling and stor-
age of agricultural and biological products.

A wide variety of employment opportunities are
available for agricultural engineers in industry,
public service, and education. Some of these
opportunities include governmental agencies;
agricultural consulting; machinery, equipment,
and facility design, manufacturing and installation;
agricultural chemical manufacturing and application; production, processing and transportation of food, feed and fiber products; management of the application of electrical power; and engineering aspects of the environment.

Other opportunities include university teaching, research and extension; positions as engineering editors, industrial consultants and positions in foreign service. The United States and most large companies have agricultural engineers in foreign countries.

In addition to the 76 semester credit hours of common requirements for engineers, agricultural engineers take courses in electronic application, instrumentation, watershed hydrology, flood control, drainage and irrigation, environmental 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.

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 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)

Associate Professor and Assistant Dean C. Wesley Holley, Ed.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. Faculty serve as academic advisers.

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 discipline as well as discipline interrelationships.

The principal focus, however, is on an applied research concept and a broader program than is normally available with the specialized research degree.

Admission Requirements. A baccalaureate degree in agriculture or a related field is required for admission. The candidate must meet requirements for acceptance into the Graduate College and be recommended by the departmental graduate committee responsible for the program.

Degree Requirements. The requirements for this degree are the same as those listed in the "Graduate College" section under "The Master's Degree."

In addition, each candidate approved for study under this program will be assigned an adviser or advisory committee with whom he or she will develop a plan of study in accordance with guidelines established in the Department. An approved preliminary plan of study must be approved by the associate dean of resident instruction and must be filed in the Graduate College Office prior to enrollment for the 17th credit hour. Departmental comprehensive final examinations will be required of all Master of Agriculture candidates.
Degree Options. Option "A" Requirements. A total of 32 approved semester credit hours of work, including an approved report having a credit hour value of not more than two semester hours, is required.

Option "B" Requirements. A total of 36 approved semester credit hours of work without a report is required and must contain a creative component.

Option "C" Requirements. A total of 36 approved semester credit hours of work which includes six hours of credit for a professional internship is required. The internship includes professional practice and a report.

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; extension education, pre-vet students gain valuable insight into the 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 agronomy 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.

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 the 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 advisor or committee may recognize specific undergraduate deficiencies and require their removal.

Biochemistry

Professor and Head Roger E. Koeppe, 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 undergraduate 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 in the Oklahoma Agricultural Experiment Station. These research activities provide opportunities for part-time employment of undergraduate majors to improve their professional competence.

Prerequisites. Although the B.S. in chemistry or biochemistry is preferred, students with strong backgrounds in other biological or physical science disciplines are eligible. Individuals not having at least eight semester credit hours in each of organic and physical chemistry and calculus must take appropriate undergraduate courses to make up deficiencies. Entering graduate students are given placement examinations to assess their chemistry background; if performance is unsatisfactory they are asked to repeat an appropriate undergraduate course without graduate credit.

Degree Requirements. A more detailed description of the graduate study program in biochemistry is available from the Department upon request. The requirements listed below complement the general graduate requirements described in the "Graduate College" section of this Catalog. After the first semester continuous attendance and participation in the departmental seminar is expected.

The Master of Science Degree. Twenty-four credit hours of formal graduate courses are required, to include BIOCH 5753 (or 4113), 5853, and 5930. In addition, a student must present an acceptable research thesis (six hours) and pass a final oral examination covering it and related material. Research advisers are selected at the end of the first semester.

The Doctor of Philosophy Degree. The course requirements are determined with the aid of the student's graduate advisory committee. Usually they follow these guidelines: total of 30-40 credit hours of formal graduate course work which 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 research thesis which contains a substantial original contribution to the field of biochemistry. The Department offers research experience in a variety of areas of biochemistry.

Entomology

Professor and Head Daniel P. Bartell, 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 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 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 courses, 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

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 all the forest resources, and grow 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.

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, or in environmental science, 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: biometry, 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 a minimum undergraduate grade-point average 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 Options A, B or C. (See the "Graduate Programs" section of "General Agriculture."). 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 forest management of turfgrass in golf courses, in parks, home landscapes, and along highways.

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 through the study of flower crops, fruit and nut crops, vegetable crops, ornamental nursery crops, and turf. The Department also offers a Ph.D. in crop science.

Prerequisites. The Department may require credit hours in horticulture and related technical subjects.

Prior to admission to the program, all applicants for advanced degrees must be approved by the head of the Department and a faculty member who will serve as the adviser. The program of study and research will be directed by the student's graduate adviser and advisory committee.

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, phytophthora, nematology, genetics, host-parasite physiology, and application of biotechnology and molecular genetics to basic plant disease research. 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
Stanley D. Green, M.M., Director of Extension
Robert L. Spurrier, Jr., Ph.D., Director of Honors Program
William Ivy, Ph.D., Director of Student Academic Services

The College of Arts and Sciences not only offers a wide variety of programs in teaching, research and extension, but also underpins and reinforces all the other programs of the University.

Apart from strong programs in the 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. The College's 23 departments and two schools offer 55 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 in the College of Business Administration offers B.A. and B.S. degrees through the College of Arts and Sciences. The Department of Biochemistry in the College of Agriculture also offers the B.S. through the College of Arts and Sciences.

The College of Arts and Sciences provides academic training 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 Office of Student Academic Services. The academic advising process in Arts and Sciences is coordinated by the Office of Student Academic Services. The counseling staff in Student Academic Services advises freshman, undecided and pre-health profession students. Departmental advisers provide advising for students who have declared their majors.

The Student Academic Services staff also represents the College in the University's on-campus recruiting activities and represents the dean in such matters as petitions for extension and correspondence, change of major or college, and student withdrawals. Services also include graduate certification, information about college programs and requirements, and referral of A&S students to campus support services.

The "Undecided" Student. The general education program in the College of Arts and Sciences, while providing the breadth necessary for a quality undergraduate education, also makes it possible for freshmen who enroll without having decided on a major field of study to make satisfactory progress toward most degrees for up to four semesters. Students who initially enroll as undecided students may explore possible major fields of study with an academic counselor in the Office of Student Academic Services while completing required basic courses.

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.
degree from that college.

Second Majors and Minors. If a student majoring in one field also completes the specified requirements for a "minor" in another field, the additional majors or minors may be noted on the student's transcript. Such specified requirements may be obtained from the department in which the second major or minor is sought. The student should, at the end of his or her senior year, ask the department head in the second major or minor to submit 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 doctor's degrees available in some. (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 intensive resources of a major comprehensive university with personal faculty attention to each student. Special honors seminars provide coverage of topical issues each semester in formats which encourage the exchange of ideas through discussion and writing. Honors seniors complete the requirements of the Honors Program by undertaking a senior honors thesis (or similar creative 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 Honors award, the Departmental Honors award in the student's major field, and the bachelor's degree with honors (which is earned by completing both General and Departmental Honors Program requirements). These awards are based on the student's transcript, and a special honors diploma is awarded to students completing the requirements 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 Program 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 cumulative grade-point average. Transfer students are eligible on the basis of the required ACT score and cumulative grade-point average.

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 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 international 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 language of the area chosen; (2) five upper-division courses (15 credit hours) pertinent to the area chosen; (3) A&S 3603, "Area 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 certificates 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 courses, receive state licensure for teaching in the secondary schools. Some programs, e.g. in 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 licensure should consult as early as possible with the adviser in their field of interest, and should apply for admission to teacher education as soon as possible, preferably before the end of their sophomore year.

It is usually possible to qualify for teaching licensure 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.

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 Option" in the "College of Agriculture" section.)

The preprofessional curricula for medical doctors, 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 students may choose courses and a major as freshmen or sophomores. This is decided in consultation with 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. Medical schools encourage study in the social sciences and humanities that contribute to the understanding of human beings in their entirety—their history and environment, their attitudes and values, their emotions, 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) in 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.

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 athletic training, cor- rective therapy, dental hygiene, nursing, occupational therapy, optometry, pharmacy, physical therapy, physician's associate, and radiologic technology.

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.

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 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, and five 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, and three hours of communication systems, 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, three additional hours of natural or mathematical sciences, and a course focused on non-Western culture. College requirements define the type of Arts and Sciences degree.

Foreign Language Proficiency Requirement. For the B.A. and B.F.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's transcript, by either 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 3213, 4113, and 4223 do not satisfy this requirement.

For the B.S. and B.M. degrees, 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 3503, 3505; GEOG 3363, 3753; HIST 3013, 3203, 3403, 3813, 4234, 3533, 3880, 4613; JAPAN 2115, 2123, 2223; PHILO 3943; 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 a list 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, 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.

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, 1613, 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, 2365, 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.

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 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 6 hours in biological science may be used to satisfy General Education and College requirements.

4. Deckage 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 students, 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
Dobro Slovo (Slavic languages)
Economics Club
HEPS 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 Alpha Theta (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 (police science honor society)
Political Science Club
Psi Chi (psychology)
Psychology Club
Public Relations Student Society of America
Russian 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
Tau Beta Sigma (band honor society)
Women in Communications

Botany and Microbiology

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

Botany

Botany is the science concerned with all facets of plant life. Green plants are the constantly renewable source of food and fiber, 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, taxonomy, anatomy, development and limnology.

Graduate Programs

Courses of research and study leading to the degrees of Master of Science and Doctor of Philosophy are offered in many areas of botany including anatomy and ultrastructure, ecology, physiology, taxonomy, limnology, population biology, genetics and development, and biotechnology-related areas such as tissue culture and plant molecular biology.

Prerequisites. Applicants for admission must have received a baccalaureate degree from an accredited college and should have had 40 semester hours (or equivalent) in upper-division courses in the biological and physical sciences.
A grade-point average of 3.00 (on a 4.00 scale) or above is required for unconditional admission. All applicants are required to submit scores for the Aptitude and Advanced Biology portions of the Graduate Record Examination.

Prerequisites for graduate degrees include successful completion of courses in the areas of plant taxonomy or field botany, plant morphology and anatomy, plant pathology or microbiology, 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 thesis 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.

Microbiology
Microbiology is the study of microorganisms (i.e., fungi, bacteria, and viruses) and their relationship to higher organisms. Areas of practical and theoretical consideration that require some understanding of microorganisms include: public health and sanitation; biotechnology, genetic engineering; food production and preservation; industrial fermentations which produce chemicals, drugs, antibiotics, alcoholic beverages, and various foods; prevention and treatment of diseases of plants, animals and man; and biodegradation of toxic chemicals and other materials present in the environment. Most of the recent advances in the current understanding of genetics at the molecular level and in genetic engineering have resulted from research involving microorganisms.

Microbiologists work in federal and state departments of public health, the fermentation industry, laboratories of pharmaceutical companies, hospitals and medical schools, and research laboratories of universities, health centers, research foundations and private companies.

Students interested in careers in microbiology should have broad interests in the biological sciences and an aptitude for biology and chemistry. For some areas of specialization, an aptitude for mathematics and physics is also essential.

Departmental courses are designed to provide comprehensive training and the skills required for working with microorganisms, as well as a broad understanding of all aspects of microbial life. Many of the microbiology positions require graduate level studies. In addition to the B.S. degree, the department offers graduate studies leading to the M.S. and Ph.D. degrees in various areas of concentration including virology, microbial physiology, microbial genetics, microbial anatomy, immunology, and several applied areas.

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.
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 “I” 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 computer science.

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 requirements 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 2.00 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 10 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 Donald L. Thompson, 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 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 undergraduate 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.

Attendance and participation 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.

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.
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.

**Computer Science**

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

Computer science is concerned with theoretical 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. Computer science offers opportunities to both specialists and generalists.

In little more than two human generations, the computing field has evolved from one associated primarily with engineering and scientific calculations of only casual interest to the layman, to a factor 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 require some familiarity with computers, not only to be able to understand them, 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 computer 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 relevant to the student's major. Students who are in their junior year may enter this program and alternate semesters in the classroom with semesters on the job. A student goes 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 3090 with 64 megabytes of primary memory and VAX clusters. 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 available for both instructional 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 UNIX networks for computer 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, students must take at least nine hours 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 computer science; the freedom to choose one of four areas and additional research assures the student of enough depth in some facets of computer 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 is required to pass an oral examination over the thesis. There is no foreign 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 areas of specialization. For Ed.D. students, one of the specialty areas must be computer 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 computer science. In general, many academic and industrial positions exist for each Ph.D. graduate.

The candidate's baccalaureate degree need not be in computer 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 and some procedure-oriented programming language such as ALGOL, COBOL, FORTRAN, or PASCAL; (4) satisfying grade-point average and Graduate Record Examination scores.

**English**

Associate Professor and Interim Head Leonard Leff, 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 ability 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 Department of English 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 15.

An undergraduate English major has three options: a traditional English major, secondary education teaching certification, or technical writing, each of which emphasizes literature and writing in varying proportions. English majors may choose from courses in all historical periods of British and American literature, from early to contemporary, and in all genres: fiction, dramatic literature, poetry, story, poetry, and drama. Every literature course emphasizes literary appreciation and analysis 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 as a writer, editor, publications manager, or information developer. 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 reasoning abilities to think critically and to write well. But one need not have definite career 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 field 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 Study”—is required of all graduate students, and only one additional course—“Teaching Freshman Composition,” “Teaching Technical Writing,” or “TESL Methodology,” depending on the student’s career goals—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 are charged in-state fees. Stipends for graduate assistants and associates are paid on a nine-month basis.

M.A. and Ph.D. Examinations. 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. Students in the TESL and technical writing options also take comprehensive examinations over their fields.

Ph.D. students are examined in five subject areas (students may exempt, with permission, of their advisory committee, 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 acquiring 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 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 in literature 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, 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, cover these 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, or British or American literature. 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 three 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 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 and other requirements 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 their dissertations original works in poetry, drama (including film scripts), 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,” “Teaching Technical Writing,” or “TESL Methodology.” This course appears on student transcripts and may be counted for English degree credit.

Foreign Languages and Literatures

Associate Professor and Head Kenneth J. Dollarhide, 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 proficiencies. 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. There is a strong 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 Olen P. Matthews, J.D., 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 characteristics of places, and in how these attributes interact. Geographers attempt to understand human behavior by answering such questions as: Where do people work? Where do they play? Where are they found? 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 for either the habilitation or the Ph.D. pursuit of studies that lead to a wide range of educational goals and careers. Students interested 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, geographic 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 sectors, 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, the Center for Applications of Remote Sensing, a computer mapping facility, an interactive weather analysis system with satellite data feed, and an ARC-INFO geographic information system. It is directly linked to the University's computing facilities through both standard and graphics terminals. The North American Culture Society (NACS) is centered in the Department and its journal North American Culture is edited and published by the Department.

The Department specializes in four areas: cultural and historical geography, resource management, regional analysis and development, and sport, recreation, and leisure. Complementary course work supporting these specialized areas is available in other departments.

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.

Graduate Programs

The Department of Geography offers work leading to the Master of Science degree. The 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 private business as well as city, regional, state and national planning agencies. Recipients of the M.S. in geography have also gone on to a variety of successful careers in other fields, including retail store location analysis, banking, and university teaching and research.

The Master of Science Degree. Admission to the master's program in geography is granted to college graduates with superior academic records. An undergraduate geography major is not required. Majors from the social, physical, and behavioral sciences and from the humanities are encouraged to apply. Incoming graduate students must demonstrate competency in cultural geography, physical geography, statistics, cartography, and other geographic concepts. If deficiencies are apparent, they will have to be corrected, possibly increasing the time needed to complete the degree.

Two basic plans of study exist for the master's degree. One plan requires a minimum of 30 credit hours including a thesis, the other is a 36-credit-hour non-thesis option. Plans of study can be developed to accommodate many interests. Major faculty interests include resource management, cultural and historical geography, regional analysis and development, and sports, recreation and leisure.

School of Geology

Sun Chair and Head Wayne A. Pettyjohn, Ph.D.

Geology is the science of the earth. As such, it utilizes information from the other physical and biological sciences, mathematics and engineering. In many ways it is a common meeting ground for these disciplines. Within geology there are many different specialties, for example economic geology, petroleum geology, ground-water geology and paleontology. However, to specialize in any area normally requires graduate study.

To achieve success in geology a student must become reasonably proficient in the information acquired from basic courses in physics, chemistry, mathematics, and, to a lesser degree, statistics and computer science.

Geologists are employed extensively in applied and pure research and in teaching. Applied research includes the exploration for and development of oil and gas fields, metallic and nonmetallic mineral deposits and reservoirs of ground water. The geologist is well-prepared to pursue and direct environmental studies. Careers in research may be found with private employers, governmental agencies or universities. Teaching positions in geology are available at all levels beginning with secondary education. As with most other sciences, more employment opportunities will be available to students with advanced training and a broad background. In general, careers as teachers at the college and university level and in research are open only to those with graduate training.

The School of Geology at OSU offers a

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broadly-based rather than a specialized undergraduate program. The program leads to a B.S. degree in geology, which prepares the student for employment with industry or for graduate study.

Graduate Programs

Prerequisites. The student should have at least 39 credit hours in geology. 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, 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 (HPEL) is a multi-faceted organizational unit encompassing three academic departments: health, physical education, and leisure; four leisure service programs: recreation, intramurals, sports clubs, and outdoor adventure; and the Health and Fitness Center. (See "Campus Recreation" in the "Student Life" section.) The programs of the School provide a complex of curricular and cocurricular activities designed to broaden the scope of the individual, and at the same time, preparing the individual professionally for useful service to mankind.

Health

Assistant Professor and Coordinator Bert H. Jacobson, Ed.D.

The program in health offers students a selection of two major undergraduate professional preparation tracks.

Track one, school health, leads to a bachelor's degree in the health major, and prepares the student to teach health in a public or private school setting. After successfully completing all course work, including a student teaching internship and the health curriculum examination, the student would be qualified for state licensure to teach in grades K-12.

Track two, community wellness, leads to a bachelor's degree in the health major, and is a non-teaching track that provides the student with expertise in developing health and wellness programs in substance abuse, stress management, gerontology, and related health promotion topics within school, university, hospital, and industrial settings, as well as community and public health agencies. Community wellness students will culminate their experience with an internship. In addition to these tracks, an emphasis in athletic training is offered that will meet state licensure.

The program in health also offers courses within the school, university, hospital, and industrial settings. 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.

Leisure

Associate Professor and Coordinator Lowell Caneday, Ph.D.

The program in leisure provides students with three basic services: (1) students may earn a Bachelor of Science degree in leisure, (2) students from other disciplines may earn a minor in leisure as a generalist offering, and (3) students from throughout the University may enroll in leisure course offerings to meet their particular needs and interests related to fitness and the wise use of leisure time.

The Bachelor of Science degree in leisure is designed to give students a professional foundation for careers in recreation and leisure services. The program, 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, 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 sciences with emphases in each area. In cooperation with the Department of Educational Administration and Higher Education, an Ed.D. in higher education with a specialization in health, physical education, and/or leisure is offered. Based on an analysis of the student's previous professional preparation and interests, an individual program consisting of course work, practical experience and research, is designed to meet the student's future needs and interests.

The Master of Science Degree. Emphases are available in health, physical education and leisure.

The Master of Science degree is not a teacher certification program. Undergraduate requirements for certification would have to be satisfied before the student is eligible for certification from the State Department of Education.

The program in health offers a master's degree with a specialization in health promotion and wellness.

The program in physical education offers a master's degree with a specialization in physical education in one of five areas: administration, pedagogy, sports psychology, and adapted or exercise science. The exercise science area contains coursework necessary for fulfilling American College of Sports Medicine's Exercise Technician or Specialist Certification.

The program in leisure offers a master's degree program with a specialization in leisure which has four areas: administration and management, outdoor recreation, therapeutic recreation and campus recreation.

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. Students are required to meet the following for full admission: (1) 3.00 GPA in an undergraduate program; (2) MAT score of 40 or GRE score of 500 verbal, 450 quantitative and 500 analytical; and (3) three letters of recommendation. Applicants not meeting these requirements are subject to review by the Graduate Screening Committee.

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 15 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, Gundersen 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 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.

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**History**

Associate Professor and Interim Head
Richard C. Rohrs, Ph.D.

History is the record, explanation and interpretation of the totality of man's activities. The study of history is unique in its concern for the time 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. and 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 prerequisites of approximately 30 semester credit hours (including 18 upper division hours) of undergraduate history courses, with an undergraduate grade-point average of at least 3.00.

**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 (HIST 5023) 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 5023), and six hours of thesis (HIST 5000). With the consent of the advisory committee, as many as 15 of these hours may be taken in related disciplines.

Plan II-(Students must be pursuing 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 36 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), "Historical Methods" (HIST 5023) and a three-hour creative component (master's research paper). This requirement is satisfied by "Special Studies in History" (HIST 6120). 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 15 of these hours may be taken in related disciplines.

**The Doctor of Philosophy Degree.** Admission to the doctoral program requires a satisfactory score on the Graduate Record Examination, 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. 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 Military
   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
   Asia
   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.

**Fields of Study:**

- History of the Ancient Mediterranean World
- Early Modern Europe to 1789
- Europe since 1789
- Asia
- Latin America
- Russia
- United States to 1877
- United States since 1877

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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 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 of which is the examination field), 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 or better in 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 opportunity for 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.

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 principles 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 "WRITING 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 typewriting 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—and frees 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 a broad range of skills and 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 publishing.
- Teaching licensure—This program, taken in conjunction with 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 a 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 newsroom 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. Some hold part-time jobs as campus correspondents for various publications or work for media in the Stillwater area. Part of the laboratory work in JB 2393, 2413, 3413, and 4413 is done on the O'Collegian or other publications.

The new curriculum is accredited by the Accrediting Council on Education for Journalism and Mass Communications, and this approval is endorsed by the American Newspaper Publishers Association, American Society of Newspaper Editors, Southern Newspaper Publishers Association and other highly regarded media groups. The journalism program is affiliated with the Oklahoma Press Association, Southwestern Journalism Congress, Society of Professional Journalists, Association for Education in Journalism and Mass Communications and the Graphic Arts and Technical Foundation.
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. They offer graduates a chance to develop abilities 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 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, National 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 supervising a program to the 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 interests.

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 mathematicians usually work in research, although they have become increasingly involved in management. The firms employing the largest number of mathematicians are in the aerospace, computer, electronics and communications industries. 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.

Many mathematicians 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. Byron W. Scott, 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 students with at least three 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 year 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 duty service commitment of five 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 student must complete 12 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 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.

All advanced course students must satisfy directed professional education (PME) requirements prior to receiving a commission. The PME consists of two essential parts—a baccalaureate degree and at least one undergraduate course from each of the following fields of study: written communication, military history, human behavior, computer literacy, and math reasoning.

The Army ROTC program is designed for individuals interested in the Department of Military Science are encouraged to visit with departmental faculty members at any time for further information concerning departmental 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 related subject areas, or (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-credit-hour plan with a well-defined creative and
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 the minimum 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 unspecified 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 predoctoral 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 thesis nor report (usually 12 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 (PHILO 3133 or 4303 or equivalents) and a course in logic (PHILO 1313 or 4303 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 six-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 each 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 5000, in which a well-reasoned, substantial piece of research on a narrowly defined topic will be written as a thesis.
3. An oral examination and defense of the thesis before the graduate faculty of the department.

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.

Students pursuing a master's or doctor's degree in another field may elect philosophy as a graduate minor. Selected courses and seminars in philosophy can broaden and complement work in such areas as economics, education, engineering, English, history, psychology, and sociology.

Philosophy

Professor and Interim Head Neil R. Luebke, 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 reformulate 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—aesthetic, 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 scholarly component if neither 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.

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 on consultation with their advisors a program which will suit their evolving career goals in the latter part of their undergraduate studies. Continued communication, beginning with the student's first semester in the Department of Physics, establishes a productive rapport between the physics major 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: PHYS 5113, 5313, 5413, 5453, 5613. In addition, nine semester credit hours of elective courses must be completed in physics, mathematics, or an allied field. These must be chosen in consultation with the student's adviser. For example, an advanced course 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 PHYS 5000 may be applied toward the M.S. thesis. 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 of 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: PHYS 5213, 5313, 5413, 5453, 5613, 6313. Also, four of the following six courses must be taken: PHYS 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

Associate Professor and Interim Head Robert E. England, 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 in positions with international, federal, state and local government agencies; teaching positions in college and high school; policy analysis and research positions with governments, businesses, civic groups and foundations; positions in journalism, public relations, political consulting or lobbying; and, via law school, the legal profession.

Graduate Programs

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 2013.

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 based 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 Greer, 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
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 courses and to answer their many questions related to career planning. Faculty members are also available to assist and advise students.

B.A. and B.S. degrees are offered in sociology. 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 sub-disciplines.

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 available 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 methodological and theoretical sociology, gerontology, family and sex roles, industrial and complex organization including stratification and other dimensions of social organization, social psychology, and theory.

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 graduate students' 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 admission 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 Graduate Record Examination and score a total of 1000 from the verbal and quantitative sections. Under exceptional circumstances other types of supportive evidence can be considered when the applicant does not meet the above criteria.

3. Three recent letters of reference from academic persons qualified to evaluate the applicant's ability to perform graduate work may be submitted.

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 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.

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. Courses are offered 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.
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 grade-point average of 3.00 (“B”) in all undergraduate work and at least a 3.00 in the major, strong letters of recommendation 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.

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 30 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

Associate Professor and Interim Head Cheryl Scott, 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 practical 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
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 professions but also many other fields that 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 faculty and students—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. Each student will be required to attain an introductory knowledge of some field of application which may be satisfied by taking two three-hour graduate courses outside the fields of statistics, mathematics and computing. Each student is required to have completed COMSC 2113 or to have demonstrated competence in a procedure-oriented language such as FORTRAN.

Theater

Professor and Head Kenneth Cox, Ph.D.

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 nonmajors. 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 advisement and to determine any possible deficiencies which will affect the admission status.

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 advisor 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 will enter with an 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 I 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.
Zoology
Professor and Head Jerry Willhm, Ph.D.

The Department of Zoology offers degree pro-
grams 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 encom-
passing all of the life sciences. By including
appropriate course work in their programs, students
can obtain licensure to teach in the second-
dary schools. Requirements for admission to den-
tal, 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 pro-
cesses 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 participa-
tion 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.

Graduate Programs

Programs of Study. 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, foun-
dations, or industry; and related administrative
positions. Specializations of faculty include cellular
physiology, comparative endocrinology, com-
parative gastro-intestinal physiology, developmen-
tal biology, ecotoxicology, invertebrate physiology,
nutritional physiology, and membrane biology.

No particular undergraduate major is pre-
ferred, but the student should have completed
most of the following: histology or embryology, com-
parative anatomy, introductory physiology,
one year of organic chemistry, quantitative
analysis, biochemistry or cell and molecular
biology, one year of physics, and calculus.
The requirements for the M.S. and Ph.D. degrees are
listed under "Zoology" below.

Wildlife and Fisheries
Ecology

The wildlife and fisheries ecology program
involves comprehensive study in the conservation
of renewable natural resources, with an emphasis
on the optimum balance between wild animal
populations and habitat requirements. Courses in
the wildlife and fisheries program fulfill the
requirements for many other applied and profes-
sional careers.

Undergraduates majoring in wildlife and
fisheries ecology may choose from communica-
tions, fisheries, and management/research areas.
Management/research emphasizes applied wildlife
and fisheries ecology and offers the best prepara-
tion for graduate study. In communications,
biological training is combined with course work
in journalism, social sciences and the uses of elec-
tronic 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 Depart-
ment 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 semester in order to diagnose weaknesses
and to help in formulating a plan of study. In addi-
tion to the general Graduate College 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 prin-
ciples administered by the advisory committee dur-
ing 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 biology and some specializations only to make up defici-
cencies. A student must pass a written and oral
qualifying examination, prepare a research pro-
posal, and complete a dissertation based on
original research and worthy of publication.

Students must complete at least 30 graduate
dissertation credits which may include a maximum
of six credit hours from the M.S. degree. Can-
didates must present a public seminar based on
the completed dissertation.

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 con-
centration 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 addi-
tion to the general requirements, students are required to show competence in a research techni-
que 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 prin-
ciples administered by the advisory committee dur-
ing 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 biology and some specializations only to make up defici-
cencies. A student must pass a written and oral
qualifying examination, prepare a research pro-
posal, 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 "max-
imum" of six credit hours from the M.S. degree. Can-
didates must present a public seminar based on
the completed dissertation.
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

Todays 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 nations 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.

Accreditation

The College of Business Administration at Oklahoma State University is fully accredited by the Accreditation Council of the American Assembly of Collegiate Schools of Business, the only recognized accrediting organization for schools of business at the university level.

High School Preparation

Although a sound high school program is adequate preparation, prospective business students will benefit from a strong background in English and mathematics. Also, course work in history and government, science, geography, computer science, foreign language and public speaking will be quite valuable.

Scholarships

Oklahoma State University has an extensive scholarship program for entering freshmen, and applications should be sent to the OSU Financial Aids Office by February 1 during one's senior year in high school. College of Business Administration scholarships are mainly reserved for sophomores, juniors, and seniors. Scholarship awards are based on academic performance, leadership and need.

Academic Advisement 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

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 and computer systems, 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. 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
semester credit hours are required. The student also may select additional hours from courses in these areas, with the opportunity of achieving either further breadth or a certain degree of depth by concentrating these hours in a particular area of interest. As part of the student's general education, one course must be selected that is identified as satisfying the International Dimension requirement.

During the freshman and sophomore years the student will complete courses in each of the following areas:

**Behavioral and social sciences:** American history, three semester credit hours; American government, three hours; and six hours elected from at least two of the following fields: anthropology, geography (except physical geography courses), history, political science, psychology and sociology.

**Humanities and fine arts:** Six semester credit hours elected from two different fields identified by the University as satisfying humanities (H) credit.

**Natural science and mathematics:** A minimum of 10 semester credit hours with the specific number of required hours in mathematics and natural science varying with the major chosen. Specific requirements for each major are published by the University in the book *Undergraduate Programs and Requirements*.

**Communications:** English composition, six semester credit hours, and introduction to public speaking, three hours.

**Pre-business core:** For business students, a minimum GPA of 2.00 in the following 30-hour pre-business core is prerequisite for MGMT 3013, MGMT 3223, MKTG 3213 and FIN 3113: ENGL 1113 and 1323; ACCTG 2103 and 2203; ECON 2013 and 2023; MATH 1513; GENAD 2103; STAT 2023; and SPCH 2713. For non-business students, the University prerequisite for upper-division courses applies. (See "Academic Regulations" elsewhere in the *Catalog*.)

**General electives:** In addition the student may elect courses from any area except lower-division aerospace studies and military science and HPEL activity courses to complete lower-division requirements.

Credits earned during the freshman and sophomore years in another institution may not be substituted for junior and senior course requirements in majors in the College of Business Administration.

**Departmental Clubs and Honor Societies**

- Alpha Kappa Psi (professional business organization)
- Beta Alpha Psi (accounting honor society)
- Beta Gamma Sigma (business administration honor society)
- Beta Upsilon Sigma (professional business organization)

**Business Student Council**

**Data Processing Management Association**

**Delta Sigma Pi (professional business organization)**

**Entrepreneurship Club**

**Financial Management Association**

**Graduate Students in Business Administration**

**Marketing Club**

**Mu Sigma Omicron (management)**

**Personnel Association**

**Phi Beta Lambda (business leadership)**

**Toastmasters**

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**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, non-business 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.

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**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, non-business organizations, and public practice, and to develop judgmental ability in accounting and III 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 undegraduate 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 is 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.

**Administrative Services**

**Professor and Head Joe W. Fowler, J.D.**

The Department offers an undergraduate major in general business.

The general business program gives students a broad, comprehensive type of business education 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 communications, 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, M.B.A.**

**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 may be earned in less time by attendance in summer session courses. Degree requirements may be reduced by a maximum of six credit hours. To be eligible for this waiver, students must have earned a baccalaureate degree in business administration at an AACSB-accredited institution within the past five years.

The individual course of study follows a personalized, interdepartmental curriculum developed in consultation 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. All individuals admitted to the program are required to demonstrate proficiency in applied calculus and personal computer usage. 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, letters of recommendation from three sources, past work experience, extracurricular and community activities, and stated career goals.

**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 application 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.

Finance

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.

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.

Graduate programs 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.

Completion of the research report upon successful completion of the dissertation 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

Professor and Head Wayne A. Meinhart, Ph.D.

The majority of accomplishments in contemporary society are created through the modern organization. Whether the goals are to realize success in business or solve the pressing problems of civilization, organizational systems must be effectively managed in order to maximize the probability of success.

As an area of study, the field of management offers dynamic, exciting possibilities to students interested in business careers, careers with complex nonprofit organizations, and to students who seek the challenge of working on relevant, real-world problems. The field of management is concerned with the analytical process and the application of relevant theory and research to solving business and organizational problems.

Examples of such problems include creating organizational structure, systems and policies; motivating people; planning courses of action; and 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, 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 taken 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.

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

Professor and Head Stephen J. Miller, Ph.D.

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 market-oriented in management.

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.
College of Education

Kenneth L. King, Ed.D., Dean and Director of Teacher Education
Kenneth H. McKinley, Ph.D., Associate Dean of Administrative Affairs and Research
Steven K. Marks, Ed.D., Coordinator of Clinical Experiences

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, 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

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)
- 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
Higher education counseling
Human development
Higher education student personnel
Instructional systems
Marriage and family therapy
Microcomputer applications
Occupational education administration

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.

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
- Outstanding Freshman Aviation Education Student Technical Education Alumni and Faculty Scholarship
- James Vandegrift Scholarship
- Amy Louise Wagner Memorial Scholarship
- Hoyt E. Walkup Scholarship

In addition to these scholarships, Oklahoma State University is allocated, on an annual basis,
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.

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, mental retardation, 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 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 electives to develop a specialized area 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. programs in elementary/middle school and secondary school counseling are 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 variety 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.

Ph.D. Programs. The Ph.D. degree offers specializations in counseling psychology, counseling and development, and student personnel administration. The didactic and experiential com-
ponents 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 professional preparation in psychology as a 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, consulting, training and research roles in various settings such as university counseling services and academic departments, child guidance centers, youth services, 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 practical 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 this 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 certification.

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 and courses selected to facilitate the development of a collateral area of expertise in another graduate area of education such as special education, curriculum and instruction, occupational education, or school administration. This M.S. program prepares students for entry level positions in research and evaluation units in school districts, government agencies, and private corporations and foundations.

Ph.D. Program. Doctoral level study in research and evaluation is available through the Ph.D. in applied behavioral studies and provides advanced 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, Ph.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 programs, specialists also present 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 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 pertaining 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

Regents 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 emphasizes one of these areas qualifying the student for a secondary (7-12) Oklahoma license. Students emphasizing art, foreign language, or physical education/health also receive a degree in secondary education and qualify for an elementary/secondary (K-12) 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 assume teaching positions 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/supervision, 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, and social studies. 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 three plans:

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 30 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 30 credit hours of approved course work which includes a creative component. The creative component role 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 found in the departmental publication Master’s Degree Policies and Regulations available in 302 Goudsen 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 specializing in 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 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 program committee and in the chairpersonship role.

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. 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 course work 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.

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 or a Miller Analogies Test 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 6003, "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 administration 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 a 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.

School of Occupational and Adult Education

Professor and Director Melvin D. Miller, Ed.D.

The School of Occupational and Adult Education (OAED) has as its central focus teachers of occupational programs and leadership personnel for these programs, together with personnel for human resource development and adult and continuing education. Just as the School of OAED is a part of the College of Education, occupational and adult education is a significant element in America's system of education. The School seeks to serve teachers, supervisors, and administrators of educational-technical programs at the middle school and secondary levels, area vo-tech schools, community and junior colleges, and technical schools; trainers and mid-management personnel in business, industry, and other private and public agencies; and adult educators employed by any of these. Accordingly, the goals of the School are:

1. To develop both undergraduate and graduate programs which prepare individuals to serve present and future needs of educational agencies, business and industry and other agencies in areas related to the field of occupational and adult education.
2. To provide extended services and non-traditional programming to the School's clients on both a pre- and in-service basis.
3. To provide specialized leadership development opportunities for individuals who seek to serve as educational or training specialists in public and private schools and in business and industry in areas related to occupational and adult education.
4. To conduct quality research in occupational and adult education and to disseminate research findings through local and national publications as well as through the OSU teleconferencing system.
5. To provide service to other departments and programs on campus through general interest courses and activities.
6. To provide programs and service at the international level, assisting in the development and advancement of programs related to the School's mission.
7. To be recognized within the state, nationally and internationally, for leadership in the various aspects of occupational and adult education.

The School of Occupational and Adult Education offers several degree programs with and without teacher certification. Teacher certification programs are available in business education, industrial technology education, marketing education, technical education, and trade and industrial education. Certification for any of the above may be met while completing one of the bachelor's or master's options available in OAED. A noncertification program is available in technical education. The masters and doctorate in OAED offer specializations in adult and continuing education, human resource development, and vocational-technical education.

Graduate Programs

The School of Occupational and Adult Education offers graduate programs leading to the Master of Science degree in the specific areas of industrial technology education, marketing education, technical education and trade and industrial education, as well as the general area of occupational and adult education. The School also offers programs leading to the Specialist in Education degree 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, applicants 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 business education curriculum, which includes courses in the College of Education with specialized education courses being taken in the School of OAED under the BUSPR (Business Professions) and OAED 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 who 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 designed toward helping individuals develop a higher level of competency in both instructional and technical skills in order to improve their classroom teaching effectiveness.

Prerequisites. Sixteen semester credit hours of undergraduate industrial technology education course work 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, and business law.

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 the graduate curriculum is to help individuals develop higher-level competencies in both instructional and occupational skills in the distributive and marketing education fields.

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-tech 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, evidence 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. Qualified students from preparatory 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 included 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 but not limited to the industrial fields of air-conditioning, heating and refrigeration, auto mechanics, bricklaying, cabinetmaking, carpentry, commercial art, cosmetology, diesel engines, drafting, electricity, electronics, individualized cooperative education, machine shop, photography, printing, plumbing, sheet metal, small engines, tailoring, upholstery, welding or 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, and 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. Emphasis is placed 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 is necessary.

Teacher Education Programs

Officers of the Teacher Education Council

Kenneth L. King, Director of Teacher Education
N. Jo Campbell, Chair of Teacher Education Faculty

Faculty Group Chairs

Vernon E. Troxel, Early Childhood Elementary Education
Deke Johnson, Secondary Education
Sandra Gangstead, Elementary Secondary Education

All Teacher Education programs are administered through the OSU Teacher Education unit and are coordinated by the director of Teacher Education through the Office of Teacher Education, 101 Gundersen Hall. Upon completion of an approved program or degree, 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 a teaching license are subject to all rules and regulations specified by the OSU Teacher Education unit and the Oklahoma State Department of Education.

Programs are offered at various levels, but all require the earning of at least a bachelor's degree for recommendation for a standard certificate. Graduate programs leading to the master's degree, the education specialist degree, and both the Doctor of Education and the Doctor of Philosophy degrees are offered in several areas. In addition, there are programs at the graduate level which lead to certification but which may or may not lead to graduate degrees.

In addition to state approval, Teacher Education programs at Oklahoma State University have the approval of the National Council for Accreditation of Teacher Education (NCATE), the national agency responsible for accrediting high-quality programs throughout the United States. Students who complete NCATE-approved programs will find certification in other states easier to secure and employment opportunities enhanced.

Undergraduate Teacher Education programs are offered in the College of Education as well as in the colleges of Agriculture, Arts and Sciences, and Home Economics. The student may choose the college in which the degree is to be earned; however, the student must meet the program requirements of the OSU Teacher Education unit as well as the degree requirements of the particular college. Each student who desires to enter a Teacher Education program must make formal...
Criteria for Admission to Undergraduate Teacher Education Programs

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 Office of Student Academic Services, 102 Gundersen Hall, for College of Education students, 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. In addition to completing this form, the student should schedule the Teacher Education interview and register for the Preprofessional Skills Test (PPST). Teacher Education interviews are generally scheduled during the first early laboratory and clinical experience. Registration booklets for the PPST are obtained from the University Testing and Evaluation Service, 109 North Murray Hall.

After declaring an intention to pursue a professional program, the student may elect to enroll in course work in the following preprofessional education areas (which must be completed before student teaching):

1. Sociological foundations;
2. Exceptional child;
3. Human development;
4. Early laboratory and clinical experiences (45-clock hours minimum);
5. Media.

The student must complete Part II: Full Admission to Teacher Education. Full admission to Teacher Education must be achieved before the student can enroll in the remaining professional education experiences. Admission to a Teacher Education program is based on several factors, including:

1. The Preprofessional Skills Test. This test is required of all Teacher Education students and is composed of mathematics, reading, English grammar and essay skills. Information and registration for the Preprofessional 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. If the student does not attain the established scores (mathematics 171, reading 173, writing 172) the adviser, in consultation with the student, will suggest remedial options. The student will then retake the Preprofessional Skills Test when recommended by the adviser, and meet the established scores. An alternative for students not passing any of the established scores of the test, is to have scored at or above the 50th percentile on the ACT or SAT and have at least a 3.00 GPA for the last 30 semester credit hours.
2. Interview for Admission to Teacher Education. All candidates for full admission to undergraduate Teacher Education must be formally interviewed by selected OSU Teacher Education faculty.
3. Orientation to Teacher Education Course and Laboratory and Clinical Experiences. An appropriate orientation to Teacher Education course must be completed with a grade of "C" or better. One semester credit hour of early laboratory and clinical experiences must be completed with a grade of "C" or better or grade of "P*.
4. Minimum Overall Cumulative GPA of 2.50. A minimum overall cumulative GPA of 2.50 must be earned, based on no fewer than 40 credit hours of courses to include lower-division general education requirements as specified in the student's program. For students not seeking certification, see "Grade-point Average for Graduation" in the "Academic Regulations" section of the Catalog.

Criteria for 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 a Teacher Education program:

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 Preprofessional Skills Test or meet published alternatives; (d) complete the interview to Teacher Education; and (e) complete one semester credit hour of early laboratory and clinical experiences 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 overall GPA of at least 2.50; (b) pass the Preprofessional Skills Test or meet published alternatives; (c) complete the interview to Teacher Education; and (d) complete one semester credit hour of early laboratory and clinical experiences and an orientation to Teacher Education course with a grade of "C" or better or a grade of "P." Transfer Students

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.

Calculating Grade-point Average for Teacher Education

In calculating the 2.50 GPA for all Teacher Education purposes other than 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 grades in a repeated course will be ignored. Grades of "I,* "NP," "P," "R," "W," "WP," or the mark of "N" will not affect the overall GPA.

Retention in Teacher Education

For continued acceptability and recommendation for a license or certification, the student must have met and maintained all specified
forms are distributed at a meeting called by the Office of Teacher Education students. The application process requires an overall GPA of at least 2.50 with no grade below a "C." In addition, the student must maintain a major GPA of at least 2.50 with no grade below a "C" and must achieve an overall grade-point average of at least 2.50; a major requirement GPA of at least 2.50 with no grade below a "C." Teacher Education students 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 education and major requirements. No grade lower than a "C" will be accepted in either of these areas.
4. Must have completed all required courses as a Teacher Education student who graduated or is seeking endorsement in their area of certification.
5. Must have achieved grades of "B" or better in all sections of student teaching in order to be recommended for a license or any level of certification.

_Requirements for admission to the Teacher Education program._ In addition, the student must maintain an overall GPA of at least 2.50; a major requirement GPA of at least 2.50 with no grade below a "C." and a professional education GPA of at least 2.50 with no grade below a "C."

**Student Teaching Profile Application**

The Student Teaching Profile Application form must be completed by the student one year prior to the student's teaching semester. The application forms are distributed at a meeting called by the coordinator of clinical experiences and through the O’Collegian student newspaper, 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. Students are encouraged to take all appropriate teacher certification tests after the completion of at least 90 semester hours of college work. (See "Oklahoma Teacher Certification Testing Program.")

Criteria for student teaching placement for all Teacher Education students 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 education and major requirements. No grade lower than a "C" will be accepted in either of these areas.
4. Must have completed all required course work which includes at least one course in sociological foundations, all early childhood and clinical experiences (45 clock hours minimum), exceptional child, and human growth and development, with no grade lower than "C" and/or "P" accepted in any of these courses. All professional sequence course work must be completed to include: learning theory, evaluation, and methods.
5. Must have achieved grades of "B" or better in all sections of student teaching in order to be recommended for a license or any level of certification.

**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, supervisor, 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 may be responsible for reimbursing OSU for at least one visit by an OSU supervisor in addition to the visitations performed by the cooperating institution. All other criteria pertaining to in-state student teaching placements will apply as previously stated.

**Appeals**

As a comprehensive land-grant university, OSU is committed to serving a diverse audience. As Teacher Education is a professional program, standards have been established that will allow only students who have been admitted to the program to continue in good standing. If a student believes that the established policies and procedures of the Teacher Education program were not consistently and accurately followed, the student will have the right to appeal to the director of Teacher Education. Information pertaining to the appeals process is available through the Office of Teacher Education.

**Oklahoma Certification Testing Program**

All students who graduate or are seeking endorsements from a Teacher Education program 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 or endorsement can be issued. The examinations are administered by the Oklahoma State Department of Education four times each year. Registration booklets are available in the Office of Teacher Education. 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 or endorsement teaching credentials as required by the Oklahoma State Department of Education.

Registration deadlines are indicated on the registration booklet and are generally due about seven weeks prior to the testing date.

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 Testing Program have been placed in the Reserve Room of the Library and are listed as "Objectives for Oklahoma Certification Testing Program."

An Oklahoma State University student must pass the Oklahoma Teacher Certification Test(s) in his or her major teaching area(s) before taking any tests in endorsement areas outside the major.

**Recommendations for License, Certificate, or Endorsement**

Oklahoma State University will not make a recommendation for a license, certificate or endorsement until all criteria have been met for the Teacher Education program and a passing score has been achieved on the Oklahoma Teacher Certification Test(s). Applications for an Oklahoma license or certificate can be obtained in the Office of Teacher Education. Students seeking advice concerning teacher licenses or certificates can be assisted by the teacher certification specialist in the Office of Teacher Education.

**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 within the local district where the beginning teacher is employed, and a higher education representative. 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 either the same or 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.
College of Engineering, Architecture and Technology

Accreditation

The following undergraduate engineering programs are separately accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET): Aerospace option in mechanical engineering Architectural engineering Agricultural engineering Chemical engineering Civil engineering Electrical engineering General engineering Industrial engineering and management Mechanical engineering

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

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 bacheloT'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 premedical options), Civil Engineering, Electrical Engineering (computer engineering option), General Engineering, Industrial Engineering and Management, Mechanical Engineering (aerospace, petroleum and premedical options), Master of Agricultural Engineering, Environmental Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, General Engineering, Industrial Engineering and Management, Manufacturing Systems Engineering, and Mechanical Engineering.

Master of Science in agricultural 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 high school, 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 in the College of Engineering, Architecture and Technology. 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.*)

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 student 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 50 semester hours of additional engineering course 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 graduation 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 is filed with the Graduate College as the preliminary plan of study for the graduate portion of the program. 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.

**Admission Requirements**

**Admission to Pre-engineering.** Students must first be admitted to the pre-engineering or pre-architecture program and complete certain minimum requirements as outlined under "Lower-division Requirements." 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 University Academic 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 University Academic Services are:

1. an overall grade-point average (GPA) of 2.30 on a 4.00 scale, and
2. a GPA of at least 2.30 at OSU in mathematics, physical science and English courses applied 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, 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, not 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, is eligible for immediate 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.

**Admission to Graduate-Professional Status.** To be admitted to graduate-professional status in a professional school in the CEAT, a student must have completed requirements for a B.S. degree in engineering, meeting the criteria 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. Scholastic 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.

**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. 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 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 1113), need not take ENGL 1213, and may take the technical 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 core course work meet the University requirement for Scientific Investigation.

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 303) 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 added.

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 continued 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.** 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 School of Architecture is contingent on a demonstration of 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 acceptable hours in "History and Theory of Architecture" for the 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 advanced standing 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 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 course work and engineering courses taken prior to admission to one half of the requirements may be completed by advanced standing examination.

All GPA's are calculated using only the last grade in any repeated course.
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 Office of Student Academic Services for these details.

Academic Advising

The College's Office of Academic Advising 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

The conditions for satisfactory progress in an academic term are:
1. at least a 2.00 GPA for the term, 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.

Probation and Suspension

1. Students in the CEAT will be placed on probation at the end of any academic term in which they fall below the criteria for satisfactory progress toward their degree objectives as stated above.
2. Probation conditions are set on an individual basis but require at least a 2.00 GPA for each term on probation. Full-time students are expected to complete at least 12 hours which apply toward the degree.
3. Students will be removed from probation at the end of any regular semester in which they meet the conditions of their probation.
4. A student will be subject to suspension at the end of any term in which he or she fails to meet either the conditions of probation or University retention standards regardless of whether he or she was on probation. (See "Academic Regulations" in the Catalog.)

Scholarships

Several scholarships are funded through private donations, alumni gifts, and industries, and vary in amounts from $400 to over $2,000 per year.

These scholarships are available for freshmen 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 29 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 scholarship applications to the head of the 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.

A student will not normally be suspended who is within 15 semester credit hours of graduation unless he or she falls below OSU retention standards.

Students who have been suspended for reasons of both unsatisfactory progress toward the degree and academic dishonesty will not be reinstated in the CEAT.

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.

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.

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

A CEAT Reinstatement Advisory Board is appointed by the dean each year with a representative from the Office of Student Academic Services, each School of Engineering, the Division of Engineering Technology and the School of Architecture. Requests for reinstatement in the CEAT should be submitted to the director of student services who serves as ex-officio chairman of the board. The chairman, the representative from the student's major, and at least one other member of the board will review and act on requests for reinstatement. Requests will not normally be considered for reinstatement earlier than one semester following the date of suspension, although exceptional circumstances will be considered for earlier reinstatement. Detailed procedures and deadlines may be obtained from the Office of Student Academic Services.
Concurrent Enrollment

If 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, 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. 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 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 27 is required.

All other OSU students and transfer students who are classified as freshmen (27 semester credit hours or fewer), with a grade-point average of 3.25 or above are eligible to join the Honors Program regardless of their ACT scores. A 3.50 GPA is required of students with 28 or more hours.

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 21 semester credit hours with grades of "A" or "B" in honors sections of basic introductory-type courses from four of the following areas: English or foreign languages, 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.

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 Astronautics & 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
Engineerettes (spouses of 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 Mechanical Technicians
Society of Petroleum Engineers
Society of Women Engineers
Tau Alpha Pi (technology honor society)
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.

School of Architecture

Professor and Head James F. Knight, M.Arch., AIA

The School, founded in 1909, offers undergraduate programs in the two areas of architecture and architectural engineering. The School's parallel program emphasis on architecture and architectural engineering involves the sharing of faculty, course work and facilities. This sharing, under one roof, is a major strength of the School and makes it one of the few such integrated programs in the United States. The School of Architecture is an element of the College of Engineering, Architecture and Technology. This organization facilitates access to state-of-the-art electives and to a wide variety of graduate course work.

The School is dedicated to providing the highest quality programs of higher education to students whose career goals are to enter the private practice of architecture and architectural engineering. This dear educational goal allows the School to focus its resources toward the specific needs of the vast majority of its students at a level of excellence not otherwise achievable.

Architecture

Architecture is the difficult and complex art and science of planning, designing and renovating settings for human life and habitation. It is a creative response to human needs. Architects design new buildings, renovate and adapt existing buildings, their interiors and their sites.

Education in architecture consists of campus-oriented classroom and studio courses, as well as off-campus studies. It is conducted in an intellectual climate which stimulates inquiry, introduces principles and values, and teaches the disciplines necessary to work in collaboration with others. The goal of the program is the education of future leaders within the architecture profession.

The design studio is the center of the School's educational program. It is the setting where students and faculty work most closely together, and where all specialized study and knowledge comes together and is synthesized in design. The record of OSU students' achievements in the design studios is evidenced by the success in national and international architectural design competitions. Over the last 40 years, the School has the second highest number of winners and finalists of any program in the United States in these prestigious competitions.

The program has long been known as one of the strongest professional programs in the United States. OSU graduates are consistently offered employment opportunities in many of the best architectural offices in Oklahoma and throughout the United States. The program is fully accredited by the National Architectural Accreditation Board.

Architectural Engineering

Architectural engineering combines the creative aspects of architecture with the analytical rigor of engineering. It differs from architecture in that architectural engineering has as its focus the design of structural and environmental elements, systems and procedures for buildings, rather than the design of individual buildings.

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.

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 enroll 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.

Graduate Programs

Educational environment. A variety of student enrollment is approximately 300 students of whom 22 percent are women and 18 percent are international. The student-faculty ratio in studio courses is extensive and personalized student-faculty interaction is emphasized. The student-faculty ratio in classroom courses, as well as examples of previous studio work. Evaluation and enrollment by the School is on a course-by-course basis for all transfer students.

Student Body. 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 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 Work. Projects submitted for regular class assignments may be retained by the School. All projects not retained will be available to the student.

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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.

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Graduates from other curricula should submit transcripts to the head of the School of Chemical Engineering for evaluation.

Admission Requirements. Admission to either the Master of Science or Doctor of Philosophy degree programs requires graduation from an institution accredited by the Accreditation Board for Engineering and Technology. 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 are 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 internship 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 30 hours of credit for research. 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 6000- 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 chemical sciences, mathematics, geology and biology.

The concern of civil engineers is man's environment-its control, alteration and utilization. Civil engineers engage in planning, designing and constructing highways, waterway and railway systems, harbors and shipping facilities, systems 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 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. Engineer-
of the student, while conforming to the general requirements implied by the title of the degree and specified by the University.

The Master of Civil Engineering or Environmental Engineering degree requires the completion of at least 18 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 Electrical 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 completion of at least 90 semester credit hours of course work beyond the bachelor’s degree, including not more than 30 semester credit hours for the research thesis. In addition, the candidate must complete six semester credit hours of course work in an area such as languages, mathematics, statistics, experimental techniques, research methodology, or similitude, as specified by the advisory committee) that will facilitate his or her research effort. Generally, official admission as a candidate for the Doctor of Philosophy degree in any program offered by the School will not be granted until a member of the Graduate Faculty in the School agrees to serve as major (or thesis) adviser for the prospective candidate.

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 computer engineering 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 advanced course work and on-campus creative faculty 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 by 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, exemplified by social, economic, and environmental processes.

Admission Requirements. 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 professional 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 or humanistic studies. 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.

The School of Electrical and Computer Engineering also participates in the Master of Manufacturing Systems Engineering Program. (See "Graduate Programs" under "Industrial Engineering and Management.")

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, while considering 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 100 semester credit hours of course work including an internship period. 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; 12 semester credit hours in an area of interest; and three semester credit hours of humanities. 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 humanities, 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 student's 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
Mechanical and Aerospace Engineering

Professor and Head Lawrence H. Hoborck
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 the power lawns mowers to automobiles, from 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 construction machinery. They make it possible for man to be represented in every possible engineering field.

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 to the 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 option.

Mechanical engineering students extend their study of the mechanical engineering sciences and consider applications of fundamental principles and analysis tools to the solution of new 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, 3M, 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 Science degree, the Master of Science degree by the aerospace option, the Master of Science degree in Mechanical Engineering, the Doctor of Philosophy degree, and the Doctor of Philosophy degree with the aerospace option.

The Master of Science degree program with the aerospace option 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 particular research emphasis 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.S. degree, M.S., Ph.D. degree, and other graduate degrees. 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 aerospace option requires 24 semester 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.

The School of Mechanical and Aerospace Engineering also participates in the Master of Manufacturing Systems Engineering degree program. (See "Graduate Programs" under "Industrial Engineering and Management.")

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, expeditor 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 composed of the following curricular subdivisions:

- Mathematics and science-algebra, trigonometry, applied calculus, general physics, and chemistry or other science.
- Technical specialty-technical science and related technical courses.
- Communication-English composition, and business or technical communication.
- Social sciences and humanities-history, government, religion, literature, art, music.
- Electives-controlled and general.

High School Preparation and Counseling

At least two semesters of high school algebra and a course in plane geometry are recommended for entering students. One year of high school credit in physics and/or chemistry is desirable.

Those less intrigued with theoretical concepts but who have the interest and aptitude toward applications are likely engineering technology majors. These students particularly appreciate the engagement of technical specialty courses beginning with the first semester and continuing throughout the course of study. The relevance of the technical science and related technical courses adds further satisfaction.

Transfer Students

An important, contemporary educational development is the "two-plus-two" bachelor's program. Those completing an associate degree in technology-oriented curricula at other institutions are generally admissible to the junior year with a minimum loss of academic time. The "two-plus-two" concept provides the attractive feature of two occupational-entry levels-technician or technologist.

Curricula

Bachelor of Science in Engineering Technology Degree Programs

Construction Management Electronics Fire Protection and Safety General Manufacturing Mechanical Design Mechanical Power

The Bachelor of Science in Engineering Technology degree credit hour requirements vary from 126 to 129 credit hours.

Construction Management Technology

Associate Professor and Head Jerrold F. Bradley, M.S., P.E.

The construction industry is the largest industry in the world. Leadership in this field requires 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 all phases of construction, designed to prepare him or her for responsible positions in industry.

The modern constructor 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 students 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 him or her with a knowledge in working drawings, mechanical and electrical equipment of buildings, 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 him or her with a knowledge in highways, soils, foundations and other course work for a career in the heavy and industrial construction industry.

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 an 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 instrumentacion.

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 United States. Essential to this system are the manufacturing industries which comprise that segment of our economic society directly responsible for the conversion of raw materials into usable products. Today these industries face numerous and complex challenges, which if met, offer promising careers to men and women who have interests in manufacturing. These career positions include such areas as tool design, cost evaluation and control, plant operations, product design and development, and manufacturing methods.

Emerging career fields include robotics, computer-integrated manufacturing and automatic assembly.

The manufacturing technology option provides educational experiences in the core areas of manufacturing processes, industrial materials, graphic communication and technical science, as well as an opportunity to develop an area of specialization. This option is available only for the bachelor's degree (an associate degree is not available). Manufacturing courses are concentrated in the last two years allowing for efficient transfer from other OSU programs or from other colleges or universities.

Mechanical Design Technology

Associate Professor and Head Gerald R. McClain, M.S., CMFGT.

Mechanical design is an activity necessary for existence of the modern world. All the conveniences of today's world have passed through the designers on their way to being useful products.

Mechanical design is applied in robotics, automotive manufacturing, computer-aided drafting and design, agriculture, petroleum industry, mining, shipbuilding, spacecrafts, electronics manufacturing, food processing, aircraft, metals and plastics production-nearly the entire spectrum of industry. Every industry requires some type of mechanical design, either directly to produce the product or indirectly to produce the tools, equipment and materials used to manufacture the product.

The computer has had an impact on few areas of technology more than mechanical design. The phrase "computer-aided design" or "CAD" means many things from computer drafting or graphics to sophisticated solids modeling and analysis. The mechanical design student is exposed to a range of applications from designing a computer to manufacturing with a computer.

It is the objective of the department that all of its graduates be proficient in using the computer as a problem solving tool both graphically and analytically.

Transfer students with an associate degree in drafting and design may transfer into the program with ease. The junior and senior years provide additional education in design principles, manufacturing processes, computer graphics, and other related areas necessary for more complex aspects of mechanical design. The mechanical design technologist with in-depth analysis and technical knowledge makes a computer-aided drafting and design work station a design tool rather than just a drafting tool. Bachelor of science graduates usually find employment in areas related to new product design and redesign, or manufacturing equipment design.

The curriculum has been carefully constructed to provide a realistic progression from the basic, or elementary principles, to advanced or more sophisticated techniques. The curriculum has two emphases available. The graphics emphasis requires the courses that would best prepare a graduate to work as a mechanical designer, tool designer, or product designer. The broad emphasis requires greater breadth and allows more flexibility to prepare for the broader fields of mechanical technology, such as, test, evaluation, operation, liaison or sales. Companies utilizing the talents of designers are diversified in their products, as well as geographical location, thus providing a variety of choices in respect to both type of work and place of residence. In addition to ABET accreditation, this technology program is certified at the Engineering Designer level by the American Institute for Design and Drafting (AIDD).

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.

Petroleum technology is primarily concerned with the application of equations and techniques toward effectively drilling for, producing, and processing petroleum fluids. Technologists 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.

Courses in this field provide 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 tasks listed above.

Petroleum technologists 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

Patricia K. Knaub, Ph.D., Dean
Lynda Harriman, Ph.D., Associate Dean for Home Economics Cooperative Extension
Margaret J. Weber, Ph.D., Interim Associate Dean for Home Economics Research
Elaine Jorgenson, Ed.D., Director of Academic Affairs
Beulah Hirschlein, Ph.D., Director of Home Economics University Extension
Diane Jackman, Ph.D., Director of Student Academic Services and Alumni Programs

The mission of the College of Home Economics at Oklahoma State University is to design and carry out research, instruction and service programs which focus on relationships, services, goods and resources, enabling individuals and families to function positively within their environment. Programs in the college provide a unique focus on individuals and their interrelationships within the social, physical, psychological, economic, political and aesthetic environments. The programs at the baccalaureate, master's and doctoral levels prepare individuals to serve as professionals in areas of specialization within government, service and business organizations which address the needs of individuals and families.

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 Institution Administration; Home Economics Education and Community Services; and Housing, Interior Design and Consumer Studies.

Each department prepares graduates to pursue professional careers in business, communications, education, extension, international service, law, medicine, public health, research, social welfare, and in a variety of 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, businesses and education.

Accreditation

All programs culminating in a B.S. in Home Economics are accredited by the Council for Accreditation, American Home Economics Association. In addition, specialized agencies have approved or accredited specific programs in the College as follows: The Foundation for Interior Design Education Research (FIDER) has accredited the undergraduate interior design program. The American Dietetic Association (ADA) has approved the AP4 Program (Approved Preprofessional Practice Program) and Plan IV dietetics program. The National Council for Accreditation of Teacher Education (NCATE) has accredited the teacher certification programs in the Department of Home Economics Education and Community Services and the nursery-grade 2 teacher certification program in the Department of Family Relations and Child Development.

Honors Program

Honors courses and seminars are available to challenge the academically-talented student enrolled in the College. These courses and seminars are taught in small classes by outstanding faculty. Eligible students may elect to pursue a General Honors program, a College Honors program or a bachelor's degree with honors. A General Honors program requires a completion of 21 honors credit hours with a grade of "A" or "B." A College Honors program requires completion of 12 upper-division honors credit hours with a cumulative GPA of 3.50. Completion of the General Honors and the College Honors programs are required to complete the bachelor's degree with honors.

Scholarships

A number of scholarships are awarded each year to students enrolled in the College of Home Economics. Approximately $65,000 in scholarships were awarded last year. 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. Students in the College are also eligible to apply for some university-wide scholarships.

Academic Advising

Faculty members provide guidance and counseling to help students accomplish their goals.

All students are advised by the director of the Office of Student Academic Services for the first two semesters. Spring semester prior to their second year, students transfer to the department of their choice where a faculty adviser is assigned in the major department. This adviser maintains a close relationship with the students throughout the remainder of their study.

Academic Programs

Undergraduate Programs. The curricula for the B.S. in Home Economics and the B.S. in Hotel and Restaurant Administration include courses which contribute to a liberal education, common requirements in home economics or hotel and restaurant administration and professional requirements. The courses which contribute to a liberal education are specified by the University and include courses in the natural and social sciences, the humanities and the arts. Courses in home economics are included for the professional preparation and are consistent with the expectations of the professional 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.

Additional details about specific requirements in any of the departments or in the School may be obtained by contacting the specific department.

Graduate Programs. The Master of Science and Doctor of Philosophy degrees are available through all departments. The Doctor of Education degree is available through the Department of Home Economics Education and Community Services.

The Master of Science degree is offered in each of the departments: clothing, textiles and merchandising; family relations and child develop-
ment; food, nutrition and institution administration; home economics education and community services; and housing, interior design and consumer studies.

Students seeking admission to a master's degree program in any of the departments must have completed 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. Evidence of academic ability (approximately a 3.00 GPA) in undergraduate work is required. The plan of study for a master's degree student is individually planned to develop academic excellence specific to the student's career goals. The master's degree requires a minimum of 30 semester credit hours including a six-hour thesis or 32 semester credit hours including a report or creative component. The selection and organization of courses are made in consultation with the department head and the student's advisory committee. At least 21 semester credit hours must be completed in courses numbered 5000 or above.

The Doctor of Philosophy degree 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 degree program available through the Department of Food, Nutrition and Institutional Administration in cooperation with other University graduate programs.

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. Admission requirements to the Ed.D. are the same as admission to the Ph.D.

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
Home Economics Veterans 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

Clothing, Textiles and Merchandising

Professor and Head Grovalynn Sisler, Ed.D.

The mission of the Department of Clothing, Textiles and Merchandising is to teach and stimulate individuals to use creative and critical thinking abilities in order to contribute to the betterment of society, particularly as related to present and projected textile and apparel needs and concerns. The undergraduate program is designed 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.

Apparel design prepares students for design careers in the apparel and textiles industry. The focus is on developing creative ability, a knowledge of textiles and apparel and an understanding of the mass production of apparel. It provides background for those who conduct, interpret, and use research involving fibers, fabrics or finishes for the consumer.

Apparel merchandising prepares students for careers in buying, selling, promoting or coordinating fashion goods. The focus is on developing competencies associated with 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.

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, 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 post-secondary and college teaching; extension; consumer education; and business and industry. The program is built around the academic background, experience, needs, special interests and professional goals of the student.

The selection and organization of courses is made in consultation with the head of the Department and a departmental graduate committee. A minimum of 18 credit hours is required in the area of clothing, textiles and merchandising.

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. 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 and 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 including synthesis of knowledge drawn from departments within and outside of home economics.

Emphasis is on attainment of competence rather than on the completion of specific numbers of credits or course work and research. Each student will develop competence in the 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.

More detailed information on graduate study in the Department of Clothing, Textiles and Merchandising can be obtained by writing the head of the department.
Family Relations and Child Development

Associate Professor and Interim Head David Fournier, 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.

Early childhood education-certification provides professional preparation of individuals to teach in public school programs for pre-kindergarten through third grade. The program provides a combination of theory, research and experiential learning that trains students to design developmentally appropriate curriculum for young children. The emphasis on developmentally appropriate early childhood education represents the philosophy of the Department and the program meets or exceeds state requirements for certification.

The child care program management non-certification option prepares individuals to work as child care professionals in day care, nursery school, Head Start, Child Development Associate Training, religious education, and private programs.

The family services option focuses on the development of individuals and families with special emphasis on family dynamics. Specifically, the goal is to offer students preprofessional preparation for employment in social and community service agencies.

Students in child development develop and demonstrate knowledge and understanding of children from birth through adolescence. The program integrates theory, knowledge and experiential learning with children. Graduates fill positions as hospital child life specialists, child care licensing workers, or administrators in agencies serving children.

The interdisciplinary gerontology option focuses on the biological, psychological and social development of older adults. Students develop a knowledge base about the special concerns, problems, and needs of the elderly and their families and the related programs and services which prepares them to work with aging populations in a wide variety of programs and environments.

The youth and adult development option focuses on developmental concerns from adolescence through the later adult life stages. Emphasis is placed on the interrelationships of relevant aspects of a person's life. Students obtain skills to work in a variety of social and community agencies.

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 pre-kindergarten-third grade teacher certification.

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. 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 recommendation, and student goals.

Students need not have majored in family relations and child development as undergraduates but must have 12 upper-division semester credit hours in home economics, human development, family studies or closely-related areas. Students not meeting these criteria will be required to complete prerequisite undergraduate courses in order to be fully admitted.

A minimum of 18 credit hours from the areas of family studies, child development, and early childhood education is 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 student's advisory committee. Five career paths are available.

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. This program prepares professionals for positions in social and community agencies.

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 on the aging process combined with exposure to the delivery of services provide a balanced degree plan for both practitioners and researchers.

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.

The marriage and family therapy plan provides students with basic knowledge, skills and a professional identity essential for entry-level practice of marital and family therapy. This plan has restrictive admission guidelines 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 until they acquire the experience needed for national certification.

The early childhood education plan provides professional career development for teachers and...
Food, Nutrition and Institution Administration

Professor and Interim Head Lea Ebro, Ph.D.

The Department of Food, Nutrition and Institution Administration prepares graduates for positions in nutrition and dietetics. This is a diverse and dynamic profession which integrates human nutrition, food service administration, food science, chemistry, physiology, management and interpersonal skills.

Two degree options and a minor are offered through the Department. 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 restaurant administration, business administration or wellness. The human nutrition option is ideal for students desiring greater depth in the physiological and biochemical sciences in preparation for medical and other professional schools, graduate study and research in human nutrition. The B.S. degree requires at least 128 semester credit hours.

When students successfully complete the academic requirements (Plan IV) and experience component (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 examination is a registered dietitian and entitled to use the initials "R.D." to signify professional competence. Many states including Oklahoma also require a mandatory license to practice dietetics in the state.

Nutrition professionals work in a wide range of settings, in both the public and private sector and assume an array of challenging responsibilities. Career opportunities for a registered/licensed dietitian 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.

The Approved Professional Practice Program (AP4) at Oklahoma State University meets the American Dietetic Association’s supervised practice requirements for registration eligibility. Its mission is to provide students with the knowledge and skills necessary to practice as an entry-level dietitian after the completion of the B.S. degree which meets Plan IV academic requirements. Students admitted to the AP4 must be enrolled concurrently in the graduate program of the Department of Food, Nutrition and Institution Administration. Students successfully completing the program may, if desired, continue to work towards a master’s degree with emphasis in human nutrition, food service management, nutrition education, or food science.

Graduate Programs

The Master of Science Degree. 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 advisor 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 a departmental graduate faculty 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.

More detailed information on graduate study in the Department of Food, Nutrition and Institution Administration can be obtained by writing the head of the department.

Home Economics Education and Community Services

Associate Professor and Interim Head Margaret Callisen, Ph.D.

The Department of Home Economics Education and Community Services offers bachelor’s, master’s, and doctoral degree programs. Through its programs, it is involved in the preparation and certification of teachers and the preparation of professionals who wish to work in information educational settings.

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) cooperative extension and (5) business. Programs meet the approval of the State Board of Education, state and federal offices of vocational and technical educa-
tion 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.

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. The School of Consumer and Community Services offers study for the Bachelor of Science Degree.

The Doctor of Philosophy Degree.

Students desiring admission to the Doctor of Philosophy program with a specialization in home economics education and community services will compile a folder for review by the departmental graduate faculty. Study for this degree includes home economics education and community services, research, and areas selected from within home economics and outside the College. 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 education and community services will compile a folder for review by the departmental 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.

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

Teaching Associate and Interim Director Jim L. Anderson, M.S.

The OSU School of Hotel and Restaurant Administration responds to the needs identified by the hospitality industry by educating motivated management personnel who will grow with the industry. The School has a reputation for providing qualified and skilled innkeepers, food and beverage service managers and nutrition and management systems researchers. A new educational facility of more than 22,500 square feet with more than 200 student rooms and 200 faculty rooms in a new building. This new facility includes classrooms, exhibition areas and faculty offices. Specific accommodations include: quality food preparation areas with state-of-the-art equipment and diverse methods of meal preparation; dining room management and table service laboratory; two fast-food service laboratories, to prepare students for multi-unit fast-food operations; laboratory for microcomputer management information systems; basic food preparation laboratory for display evaluation, instruction and research; hotel and food service equipment and facilities design laboratory; classroom and demonstration area; front office procedures laboratory; offices for administrative faculty and staff; and resource center.

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 opportunities.

To meet the needs of the industry and to provide sound academic training at the undergraduate level, the curriculum emphasizes 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 education requirements are met through courses in English and the natural and social sciences, humanities, political science, history and government, 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 cooking 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 enables the student to select one of two areas included in the Department. The degree requires 124 credit hours...
and leads to the Bachelor of Science degree with an option in 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 interior design option encompasses interior spaces for residential and commercial design with emphasis on human interaction and functioning. Competencies include 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. Specialized opportunities allow students to focus on lighting and technology. Career opportunities include professional practice in interior and architectural firms, historic restoration and preservation, and facility management. The Foundation for Interior Design Education Research (FIDER) has accredited the undergraduate interior design program.

The consumer studies option focuses on individuals and families as consumers and provides a people-oriented approach to the study of economic aspects of individual and family living. Consumer studies students take a common core of classes and select an area of specialization-public policy, consumer relations or business. The public policy area is the study of the effect of economic and social policy on individuals and families. It is also the investigation of how individual and family units have an impact on development and implementation of policies. The consumer relations area prepares students to advocate consumer interests. Communication skills are developed for effective dissemination of consumer information. Students in the business area develop an understanding of individual and family needs, financial alternatives to meet these needs, and the social and economic systems in which families operate.

**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 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. 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. 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.

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.

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.
Chapter Title

College of Osteopathic Medicine

Clyde B. Jensen, Ph.D., President
Jack R. Wolfe, D.O., Dean of Academic Affairs
Robert C. Ritter, Ph.D., Associate Dean of Basic Sciences
Larry D. Cherry, D.O., Associate Dean of General Medicine
Richard A. Wansley, Ph.D., Assistant Dean of Sponsored Programs and Service
Wennette W. Pegues, Ed.D., Assistant Dean of Students
Tom E. Denton, D.O., Clinic Director
Gary H. Watson, Ph.D., Director of Research

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), 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.

College Curriculum

Divided into Basic Sciences and General Medicine, 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 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) 582-1972
Toll-free in Oklahoma, 1-800-256-1972

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-Fort Worth Medical Center, 377 beds
Charles Still Hospital (Jefferson City, MO.), 184 beds
Coffeyville Regional Medical Center, 150 beds
Hillcrest Health Center (Oklahoma City, OK), 148 beds
Enid Memorial Hospital, 104 beds
Riverside Hospital (Wichita, KS.), 87 beds
Pauls Valley General Hospital, 70 beds
Tahlequah City Hospital, 51 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.
College of Veterinary Medicine

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, pre-medical and pre-dental students which must include both the aliphatic and aromatic series of organic compounds. Additionally four semester credit hours of biochemistry (three hours lecture and one hour laboratory) are required.

Physics—eight 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.

Biology—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

Enrollment in veterinary medicine is restricted. Applications for admission must be submitted by December 15, and a new class enters the College each year at the beginning of the fall semester.

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.
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 session, 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 prior to admission to the departmental program. When this is not possible, two temporary advisors will be assigned by the Department. After acceptance to the Department, the student shall be assigned a major professor. Professor and Head Grant H. Turnwald, B.V.Sc., M.S., will be the major professor for students pursuing the Master of Science degree. Professor and Head Robert W. Fulton, D.V.M., Ph.D., will be the major professor for students pursuing the Doctor of Philosophy degree.

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 six 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 a thesis. A report must be submitted to the Graduate College for partial fulfillment of the requirements for the degree. The student must present the thesis or report in a seminar in the Department and pass a final oral examination at that time. The courses forming the student's program will be tailored to meet the student's needs and interests; however, all courses must be selected to meet the requirements for the degree. The thesis or report and related course work are expected to be completed within two academic years from the time of acceptance to the Department.

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 dissertation. The courses required are determined by the graduate advisory committee in conference with the student. The 90 semester credit hours must include all or a part of the work completed for a master's degree. The student must pass written and oral qualifying examinations. A doctoral dissertation based on original research must be accepted by the graduate advisory committee and submitted to the Graduate College. The student must present the 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).
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 (VPARA 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. Confer, 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


Assistant Professors Brian Adam, Ph.D.; Michael R. Dicks, Ph.D.; Damona G. Doye, Ph.D.; Stephen R. Koontz, Ph.D.; Derrell S. Peal, Ph.D.; David A. Pyles, Ph.D.

Agricultural Education

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


Agricultural Engineering

Professor and Head David R. Thompson, Ph.D.


Agriculture (General)

Associate Professor and Assistant Dean C. Wesley Holley, Ed.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.


Biochemistry

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


Entomology


Forestry

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


Horticulture and Landscape Architecture

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

Professors Paul J. Mitchell, M.S.; 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.


Plant Pathology

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


COLLEGE OF ARTS AND SCIENCES

Art

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


Botany and Microbiology

Botany

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

Professors Becky B. Johnson, Ph.D.; James K. McPherson, Ph.D.; James D. Ownby, Ph.D.; Paul E. Richardson, Ph.D.; Ronald J. Tyrl, Ph.D. Associate Professors Anne Ewing, Ph.D. (adjunct); David W. Meinke, Ph.D.; Susan Studlar, Ph.D. (adjunct)

Assistant Professors Michael W. Palmer, Ph.D.; Arnon Rikin, Ph.D.

Microbiology

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

Professors Norman N. Durham, Ph.D.; Mark R. Sanborn, Ph.D.; Helen Vishniac, Ph.D.

Assistant Professors Kim Burnham, Ph.D.; David M. Roberts, M.F.A.; Mark D. Sisson, M.A.; J. Ron Sholar, Ph.D.; Billy B. Wilkinson, Ph.D.
Political Science
Associate Professor and Interim Head Robert England, Ph.D.

Professors
Robert Darcy, Ph.D.; Bertil L. Hanson, Ph.D.; James L. Lawler, Ph.D., J.D.; Robert L. Spurrir, Jr., Ph.D.
Associate Professors Anthony E. Brown, Ph.D.; William McParle, Ph.D.; Franz von Sauer, Ph.D.; Joseph Westphal, Ph.D.
Assistant Professors David Billeaux, Ph.D.; James A. Davis, Ph.D.; Joel M. Jenswald, Ph.D.
Instructor Danny M. Adkison, Ed.D.

Psychology
Associate Professor and Head Vicki Green, Ph.D.

Professors
Associate Professors Bob Homan, Ph.D.; Larry Hochoaus, Ph.D.; James Price, Ph.D.; Bill C. Scott, Ph.D.
Assistant Professors Daniel W. McNeill, Ph.D., David Thomas, Ph.D.
Academic Counselor Carolyn Gang, M.S.
Coordinator, Minority Graduate Student Program Molly Tovar, M.A.T.

Religious Studies
Adjunct Assistant Professor William Ivy, Ph.D.
Associate Professor James S. Thayer, Ph.D.

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 Kiser, Ph.D.
Assistant Professors Lynn Atkinson, Ph.D.; John Cross, Ph.D.; David Knott, Ph.D.; Keith Moore, Ph.D.; Carol Olson, Ed.D.
Academic Counselor Georgia Hecock, M.A.

Speech Communication
Associate Professor and Head Paul D. Harper, Ph.D.

Professor
James Hughey, Ph.D.

Associate Professor Mike Stano, Ph.D.
Assistant Professors Bens Harper, Ed.D.; William Morphis, M.A.; Jeffrey McQuillen, Ph.D.

Speech and Language Pathology and Audiology
Associate Professor and Interim Head Cheryl Scott, Ph.D.

Associate Professors Nancy Monroe, Ph.D.; Arthur L. Pentz, Ph.D.
Assistant Professor Mike Stano, Ph.D.
Assistant Professors Bens Harper, Ed.D.; William Morphis, M.A.; Jeffrey McQuillen, Ph.D.

Theater
Professor and Head Kenneth Cox, Ph.D.
Professor Jerry L. David, Ph.D.
Associate Professor Mary Anne Henpe, 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 A. Bantle, Ph.D.; Calvin Beames, Jr., Ph.D.; L. Herbert Bruneau, Ph.D.; Sterling Burks, Ph.D.; Anthony Echelle, Ph.D.; H. James Harmon, Ph.D.; Rudolph Miller, Ph.D.; James Shaw, Ph.D.; John Thornton, Ph.D.; Dale Toetz, Ph.D.
Associate Professors James Blankmeyer, Ph.D.; Tracy Carter, Ph.D.; Margaret S. Ewing, Ph.D.; Stanley Fox, Ph.D.; Jerry Hurst, Ph.D.; David Leslie, Ph.D.; Robert Lomchner, Ph.D.; Helen Miller, Ph.D.; Larry Talent, Ph.D.
Assistant Professors Zola Drain, Ph.D.; Karen McBee, Ph.D.; Curt Ostrander, Ph.D.

COLLEGE OF BUSINESS ADMINISTRATION

School of Accounting
Professor and Head Lanny G. Chasteen, Ph.D., CPA

Professors Patrick B. Dorr, Ph.D., CPA; Lawrence H. Hammer, D.B.A., CPA; Don R. Hansen, Ph.D., CMA; Amy H. Lai, Ph.D., CPA; Gary K. Meek, Ph.D., CPA; Dennis H. Patz, Ph.D., CPA; John W. Willguss, Ph.D., CPA

Assistant Professors Dale E. Armstrong, Ph.D., CPA; Janet Kingmibrell, Ph.D., CPA; M.E. Lacy, Ph.D., CPA; Maryanne M. Mowen, Ph.D., CPA; Kevin E. Murphy, Ph.D., CPA; Charles R. Ransom, Ph.D., CPA; Charlotte J. Wright, Ph.D., CPA

Assistant Professors Dan Edwards, Ph.D.; David S. Murphy, Ph.D., CPA; Michael F. Thomas, Ph.D.; Thomas S. Wetzl, Ph.D.

Administrative Services
Professor and Head Joe W. Fowler, J.D.

Professors John T. Baile, Jr., Ed.D.; Dennis L. Mott, Ed.D.; Zelfa Quible, Ph.D.
Associate Professor Jeanine D. Rhea, Ed.D.
Assistant Professors James F. Jackman, J.D.; Tipton F. McCubins, J.D.; Greg Mosier, Ed.D., J.D.; Andrew L. Urich, J.D.

Business Administration
M.B.A. Program Director Cynthia S. Gray, M.B.A.

Economics
Professor and Head Ronald L. Moomaw, Ph.D.

Regents
Professors Frank G. Steindl, Ph.D.; Larkin B. Warner, Ph.D.
Regents Distinguished Service Professor Richard W. Poole, Ph.D.
Associate Professors Michael J. Applegate, Ph.D.; Dwayne W. Knebeck, Ph.D.; Edward D. Price, Ill, Ph.D.; Keith D. Willett, Ph.D.
Assistant Professors Kevin M. Currier, Ph.D.; James R. Rain, Ph.D.; Mary N. Gade, Ph.D.; Andrea Savvides, Ph.D.

Finance
Professor and Head Gary Simpson, Ph.D.

Associate Professors James F. Jackson, Jr., Ph.D.; Ronald K. Miller, Ph.D.
Professors Mary S. Broske, Ph.D.; Anne E. Gleason, Ph.D.; Janice N. Jadlow, Ph.D.; Timothy L. Krethbel, Ph.D.

Management
Professor and Head Wayne A. Meinhart, Ph.D.

Regents
Professor Hon-Shiang Lau, Ph.D.

Professors Richard A. Aukerman, Ph.D.; G. Daryl Nord, Ph.D.

Marketing
Professor and Head Stephen J. Miller, Ph.D.


Associate Professors Raymond P. Fisk, D.B.A.; James Hromas, Ph.D.; Ruth H. Krieger, Ph.D.; L. Lee Manzer, Ph.D.; Joshua L. Wiener, Ph.D.; Clifford E. Young, Ph.D.
Assistant Professors Jerry R. Goolsby, Ph.D.; Ajay Sukhthial, Ph.D.

COLLEGE OF EDUCATION

Applied Behavioral Studies
Professor and Head Dale R. Fuqua, Ph.D.


Paul G. Warden, Ph.D.
Assistant Professors Marcia M. Dickman, Ph.D.; Janice E. Williams, Ph.D.


Sheila G. Maxwell, Ph.D.; Nancy Mize, Ph.D.

Patrick Murphy, Ed.D.; Kent Sampson, M.S.; Howard Shippe, Ed.D.; Donald Young, Ed.D.
Instructor Susan Richardson, M.S.

Aviation and Space Education
Professor and Head Kenneth E. Wiggins, Ph.D.

Assistant Professors Nelson J. Ehrlich, Ed.D.; Steven K. Marks, Ed.D.; George McElhoe, M.S.; Glen Nemecek, M.S.

Curriculum and Instruction

Regents
Professor and Head Douglas B. Anderson, Ph.D.


David Yellin, Ph.D.

Associate Professors

EDUCATIONAL ADMINISTRATION AND HIGHER EDUCATION

PROFESSOR AND HEAD THOMAS A. ARMAN, Ph.D.

PROFESSORS RONALD S. BEER, Ph.D.; JOHN J. GARDINER, Ph.D.; KENNETH M. HINCHLY, Ph.D.; JENNIFER L. KENNER, Ed.D.


ASSISTANT PROFESSORS ADRIENNE HYLE, Ph.D.; DAVID WEBSTER, Ph.D.

SCHOOL OF OCCUPATIONAL AND ADULT EDUCATION

PROFESSOR AND DIRECTOR MELVIN D. MILLER, Ed.D.

ADJUNCT PROFESSOR FRANCIS TUTTLE, Ed.D.


SHELBY GARRISON, M.S.

COLLEGE OF ENGINEERING, ARCHITECTURE AND TECHNOLOGY

AGRICULTURAL ENGINEERING

PROFESSOR AND HEAD DAVID R. THOMPSON, Ph.D.


ASSOCIATE ASSOCIATE PROFESSORS GLEN O. BROWN, Ph.D.; THOMAS A. ESC, Ph.D.; HARRY L. FIELD, Ed.D.; GREGORY HANSON, Ph.D. (ADJUNCT); MICHAEL A. KIZER, Ph.D.; KERRY ROBINSON, M.S. (ADJUNCT)

SCHOOL OF ARCHITECTURE

PROFESSOR AND HEAD JAMES F. KNIGHT, M.Arch., AIA


DESIGN, AIA; NIGEL R. JONES, M.Arch., RIBA (VISITING); STEVE E. O’HARA, M.Arch.Eng; J. RANDALL SELTSINGER, M.Arch. (VISITING); JEFFREY K. WILLIAMS, M.Arch., AIA

CHEMICAL ENGINEERING

PROFESSORS AND HEAD ROBERT J. MCLAREN, Ph.D., P.E.; REGENTS PROFESSOR AND HEAD LAWRENCE L. HOBEROK, Ph.D., P.E.

REGENTS PROFESSOR AND HEAD ROBERT L. ROBINSON, Jr., Ph.D., P.E.

PROFESSORS KEVIN D. NEGLEY, Ph.D., P.E.; PETER M. MORETTI, Ph.D., P.E.; ERIC PRICE, Ph.D., P.E.; KARL N. REID, Sc.D., P.E.; ROBERT L. SWAIM, Ph.D., P.E.; MERLIN L. MILLETT, Jr., Ph.D. (ADJUNCT); LARRY D. ZIRKLE, Ph.D., P.E. ASSOCIATE PROFESSORS FRANKLIN W. CHAMBERS, Ph.D., P.E.; RONALD L. DELAHOUSEY, Ph.D.; LOU D. DUGHERTY, Ph.D.; BRUCE A. FEIERTAG, B.S. (ADJUNCT); AFSHIN J. GHAJAR, Ph.D., P.E.; JAMES K. WOO, Ph.D., P.E.; ING-TSAING HONG, Ph.D. (ADJUNCT); DON A. LUCCA, Ph.D.; JOHN J. SHELTON, Ph.D. (ADJUNCT); GARY E. YOUNG, Ph.D., P.E. ASSISTANT PROFESSORS YUH CHENG SHIAU, Ph.D.; JOFFREY D. SPITLER, Ph.D. LECTURERS HOWARD E. CONLON, M.S., P.E.; CURTIS VICKERY, M.S.

DIVISION OF ENGINEERING TECHNOLOGY

PROFESSOR AND DIRECTOR JAMES E. BOSE, Ph.D., P.E.

CONSTRUCTION MANAGEMENT TECHNOLOGY

ASSOCIATE PROFESSOR AND HEAD JERROLD F. BRADLEY, M.S., P.E.

ASSOCIATE PROFESSORS CLARENCE L. MARTIN, M.Arch., AIA; CHARLES A. RICH, M.S.

ELECTRONICS AND COMPUTATIONAL TECHNOLOGY

ASSOCIATE PROFESSOR AND HEAD THOMAS G. BERTENSHAW, M.S., M.ED.


FIRE PROTECTION AND SAFETY TECHNOLOGY

ASSOCIATE PROFESSOR AND HEAD HAROLD RACE, M.S.

ASSOCIATE PROFESSORS LARRY BORGERT, M.S., C.S.P., P.E.; PAT D. BROCK, M.S., P.E. ASSISTANT PROFESSOR JIM L. HANSON, M.S., C.S.P.

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PROFESSOR AND HEAD JAMES E. BOSE, Ph.D., P.E.

MANUFACTURING TECHNOLOGY

ASSOCIATE PROFESSOR AND HEAD GERALD R. MCCLEAN, M.S., CMFGT.

PROFESSOR GARY S. HANSEN, Ph.D., CMFGT. ASSISTANT PROFESSORS MIKE MAGILL, M.S.; JOHN C. SCHEILING, B.S.

MECHANICAL DESIGN TECHNOLOGY

ASSOCIATE PROFESSOR AND HEAD GERALD R. MCCLEAN, M.S., CMFGT.

PROFESSOR GARY S. HANSEN, Ph.D., CMFGT.; RAYMOND F. NEATHERY, Ph.D., P.E. ASSOCIATE PROFESSOR D. JAMIE BAYLES, Ph.D., P.E. ASSISTANT PROFESSORS MIKE MAGILL, M.S.; JOHN C. SCHEILING, B.S.; LARRY D. SIMMONS, M.S.; SCOTT THOMAS, M.S. ASSOCIATE PROFESSOR AARON ELINAR, B.A.

MECHANICAL POWER TECHNOLOGY

PROFESSOR AND HEAD MARVIN D. SMITH, Ph.D., P.E.

PROFESSORS EUGENE K. BUCHHOLZ, Ph.D., P.E.; BILLY COOKER, Ed.D. ASSOCIATE PROFESSOR FREDERICK D. NORVILLE, M.S., P.E.

PETROLEUM TECHNOLOGY

PROFESSOR AND HEAD MARVIN D. SMITH, Ph.D., P.E.

PROFESSOR DON ADAMS, Ph.D. ASSOCIATE PROFESSOR FRANKLIN E. ECKHART, M.S., P.E.
COLLEGE OF HOME ECONOMICS

Clothing, Textiles and Merchandising
Professor and Head Grovalyn Sisters, Ed.D.
Professor Donna B. Blakely, Ph.D.
Associate Professors Marilyn Burns, Ph.D.; Laura Jolly, Ph.D.; M. Lynne Richards, Ph.D.; Assistant Professors Jan Park, Ph.D.; Tana Stufflebean, Ph.D. Instructor Louise Schroeder, M.S.

Family Relations and Child Development
Associate Professor and Interim Head David G. Fournier, Ph.D.
Professor Patricia K. Knaub, Ph.D. Associate Professors Patricia Self, Ph.D.; Joseph Weber, Ph.D. Assistant Professors Donna Coughenour, Ph.D.; Walt Davis, Ph.D. (adjunct); JoAnn Farver, Ph.D.; Arlene Fulton, Ph.D.; Charles Hendrix, Ph.D.; Carolyn Henry, Ph.D.; Mona Lane, Ph.D.; Wayne Matthews, Ph.D.; Ann Mills, M.S.; Kay Murphy, Ph.D.; John Rusco, M.D. (visiting); Ruth Tomes, Ph.D.; Elaine Wilson, Ph.D. Instructors Barbara Heister, M.S.; Faye Ann Presnal, M.S.

Food, Nutrition and Institution Administration
Professor and Interim Head Lea Ebro, Ph.D.
Associate Professors N. Sue Knight, Ph.D.; Bernice Kopel, Ed.D.; Jerrold Leong, Ph.D.; Barbara Stoeker, Ph.D. Assistant Professors Barbara Brown, Ph.D.; Christa Hansen, Ph.D.; Janice Hermann, Ph.D.; Ibrahim Wathen, Ph.D. Instructor Andrea Arquill, Ph.D.

Home Economics Education and Community Services
Associate Professor and Interim Head Margaret Callison, Ph.D.
Professors Lynda Harriman, Ph.D.; Beulah M. Hirschlein, Ph.D.; Elaine Jorgenson, Ed.D. Associate Professor Bettye Gaffney, Ed.D. Assistant Professors Donna Cadwalader, Ph.D.; Renee Daugherty, Ph.D.; Sheila Forbes, Ph.D.; Diane Jackie, Ph.D. Instructor Billie Chambers, Ph.D.

School of Hotel and Restaurant Administration
Teaching Associate and Interim Director Jim L. Anderson, M.S.
Professor G. Baker Bokorny, Ed.D. Associate Professor N. Sue Knight, Ph.D.; Jerrold Leong, Ph.D. Instructors Dan Crafts, M.S.; Donald Rose, M.S.

Housing, Interior Design and Consumer Studies
Professor and Interim Head Margaret J. Weber, Ph.D.
Professor Dorothy Goss, Ph.D. Associate Professors Glennis Couchman, Ph.D.; Sue Williams, Ph.D. Assistant Professors Bill Reitz, M.S.; Gwen Brewer, Ph.D. (visiting); Aisha Hedges-Nezioga, M.S. (visiting); Gong Soong Hong, Ph.D. (visiting) Instructors Pat Donovan, M.S. (visiting); Detera Daguere McCull, M.S. (visiting) Assistant Extension Specialists Sarah Drummond, Ph.D.; Virginia Solis, M.S.

COLLEGE OF OSTEOPATHIC MEDICINE

General Medicine
Professor and Associate Dean Larry D. Cherry, D.O.

General Medicine

General Practice
Associate Professor and Chair Thomas R. Pickard, D.O.

Internal Medicine

Obstetrics/Gynecology

Osteopathic Principles and Practices
Associate Professor and Chair Kenneth E. Graham, D.O.

Pathology
Professor and Chair Dianne Miller-Hardy, Ph.D.

Pediatrics
Associate Professor William R. Kennedy, D.O.

Psychiatry/Behavioral Sciences
Professor and Chair J. C. Doggett, Ph.D.
Professor Rosalie J. Lawson, Ph.D. Associate Professors Richard H. Bost, Ph.D.; Susan K. Geiss, Ph.D.; Michael H. Pollak, Ph.D. Assistant Professor Wnette W. Pegues, Ed.D.

Radiology

Research
Associate Professor Richard A. Wansley, Ph.D.

Surgery
Clinical Professors (part-time appointment) Harold L. Battefield, D.O.; James J. Trussell, D.O. Clinical Associate Professor (part-time appointment) D. K. Watson, 0.0. Clinical Assistant Professor (part-time appointment) Ronald E. Jackson, D.O.

Basic Sciences
Professor and Associate Dean Robert C. Ritter, Ph.D.

Basic Sciences
Clinical Associate Professor (part-time appointment) Thad Taylor, D.D.S.

Anatomy
Professor and Chair Kirby L. Jarolim, Ph.D. Professors Gerald R. Kirk, Ph.D.; Daniel E. Overack, Ph.D.; James F. Taylor, Ph.D. Assistant Professor William D. Meek, Ph.D.

Biochemistry/Microbiology
Professor and Chair Martin W. Bansbach, Ph.D.
Professors Robert S. Conrad, Ph.D.; Charles G. Sanny, Ph.D. Associate Professor Joseph A. Price, III, Ph.D. Assistant Professors Orwin W. Onad, Ph.D.; Gary H. Watson, Ph.D.

Physiology/Pharmacology
Professor and Chair George M. Brenner, Ph.D.
Professors Loren G. Martin, Ph.D.; William G. Robertson, Ph.D. Associate Professor Warren E. Finn, Ph.D. Assistant Professor Mark A. Mitchell, Ph.D.

COLLEGE OF VETERINARY MEDICINE

Physiological Science
Professor and Interim Head Lloyd C. Faulkner, D.V.M., Ph.D.

Veterinary Medicine and Surgery
Professor and Head *Grant H. Turnwald, B.V.Sc., M.S.


Veterinary Parasitology, Microbiology and Public Health
Professor and Head  *Robert W. Fulton, D.V.M., Ph.D.

Veterinary Pathology
Professor and Head  Anthony W. Confer, 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.  Bacteriologist  *Ronald D. Welsh, D.V.M., M.S.

* Board Certification in Specialty Area
Graduate College

Graduate College Calendar

(Refer also to the "University Calendar")

First Semester-1990-91, Fall

August 27, Monday
Class work begins

September 7, Friday
Last day to file a diploma application

Applications for graduate credit for graduating seniors due

November 9, Friday
FINAL DRAFT copy of dissertations, theses and reports due

Application for admission to spring candidacy due for doctoral and Ed.S. candidates

November 26, Monday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS 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

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

Summer 1991

Regular 8-Week Summer Session

June 3, Monday
Class work begins

June 7, Friday
Last day to file a diploma application

June 7, Friday
FINAL DRAFT copy of dissertations, theses and reports due

June 14, Friday
Applications for graduate credit for graduating seniors due

June 21, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due

July 5, Friday
FINAL COPIES of dissertations, theses and reports due by summer candidates

July 26, Friday
Graduate College Hooding Convocation

July 29, Monday
Class work ends (makeup exams)

First Semester-1991-92, Fall

August 26, Monday
Class work begins

September 6, Friday
Last day to file a diploma application

Applications for graduate credit for graduating seniors due

November 8, Friday
FINAL DRAFT copy of dissertations, theses and reports due

November 8, Friday
Application for admission to spring candidacy due for doctoral and Ed.S. candidates

November 22, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATION due

December 6, Friday
FINAL COPIES of dissertations, theses and reports due by fall candidates

December 15, Sunday
Graduate College Hooding Convocation

December 20, Friday
Class work ends

Second Semester-1991-92, Spring

January 13, Monday
Class work begins

January 24, Friday
Last day to file a diploma application

Applications for graduate credit for graduating seniors due

March 27, Friday
FINAL DRAFT copy of dissertations, theses and reports due

April 10, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due

April 24, Friday
FINAL COPIES of dissertations, theses and reports due by spring candidates

April 24, Friday
Application for admission to fall candidacy due for doctoral and Ed.S. candidates

May 8, Friday
Class work ends

May 8, Friday
Graduate College Hooding Convocation

May 9, Saturday
University Commencement

Summer 1992

Regular 8-Week Summer Session

June 1, Monday
Class work begins

June 5, Friday
Last day to file a diploma application

June 5, Friday
FINAL DRAFT copy of dissertations, theses and reports due

June 12, Friday
Applications for graduate credit for graduating seniors due

June 19, Friday
RESULTS of doctoral, Ed.S., and Plan I, Plan II or Plan III master's FINAL EXAMINATIONS due

July 2, Thursday
FINAL COPIES of dissertations, theses and reports due by summer candidates

July 24, Friday
Graduate College Hooding Convocation

July 27, Monday
Class work ends (makeup exams)
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
1991-Laval Verhalen
1993-Robert Wettemann
1991-David Buchanan

Group II-Humanities
1990-Thomas Warren
1992-Art Pentz
1990-Linda Leavell

Group III-Physical Sciences and Technology
1991-Leroy Folks
1993-Roger Koeppa
1990-Wayne Powell

Group IV-Social Sciences
1990-Richard Dodder
1992-Daniel Tilley
1990-Robert Darcy

Group V-Teacher Education
1991-Zane Quible
1993-Judith Dobson
1991-Garry Bice

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 Rt. 1, Box 65A 918-482-3822
Irrigation Research Station Rt. 1, Box 84 482-3459
Kiamichi Field Station Rt. 1, Box 228 286-5175
North Central Research Station Box 141 796-2447
Pecan Research Station LaFay, OK 73554 918-866-2263
Sandyland Research Station Mangum, OK 73554 787-2046
South Central Research Station Lane, OK 74555 889-7890
Southwest Agronomy Research Station Chickasha, OK 73018 224-4476
Noble Research Center for Agriculture 139 Agricultural Hall 744-5398
Vegetable Research Station Rt. 3, Box 20 918-369-2441
Center for Aerospace Education 300 North Cordell 744-7015
Remote Sensing
Center for Applied Research 107 Thatcher Hall 744-5178
Center for Automated Design 218 Engineering North 744-5900
Center for Consumer Services 016 Home Economics 744-5040
Center for Economic Education 112 Business Building 744-5204
Center for International Trade 109 Cordell Hall 744-7693
Development
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 744-5054
Fluid Power Research Center 118 Fluid Power 744-7375
Research Center
Human Nutrition Center 425 Home Economics 744-5040
Human Resources Development Center 406 Gundersen Building 744-6275
Instructional Materials Center 203 Gundersen Hall 744-7124
Laser Spectroscopy Facility 232 Physical Science 744-5796
Materials Synthesis and Analysis 227 Physical Science 744-5796
Characterization Laboratory
Natural Resources and Environmental Education Center 306 Gundersen Hall 744-7122
Agriculture Experiment Station 425 Gundersen Hall 744-6056
Management Program
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.

In the College of Arts and Sciences, the medical technology program is accredited by the National Accrediting Association of Clinical Laboratory Sciences; 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 Edmon Low Library contains over 1,500,000 volumes, 2,100,000 microform units and over 165,000 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 check-out 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 3090-200S with a Vector Facility, operating MV/S/XA under VM/XA; a DEC VAX VMS cluster including an 11/780, a 6320, and several VAX station 3100S; and a VAX Ultrix cluster including an 8350 and VAX station 3100S. 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 Science 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, and an optional meal plan in neighboring cafeterias. Vending machines and microwave ovens are conveniently placed 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 percent of the time.

To apply for either housing service, an application and deposit must be filed with the appropriate office. For further information, contact the Office of Residential Life or University Apartments. Early application is suggested.

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

Intensive exercising involves complete development of the mind, body and spirit. 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 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 if 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 Student Financial Aid, 110 Hanner Hall); apply directly to academic departments.

Award: Varies; awards granted by semester.

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.
Oklahoma Tuition Aid Grant (Need Based)

Eligibility: Oklahoma resident; enrolled in a graduate degree program; making satisfactory progress toward a degree.

Application: Successful completion of ACT Family Financial Statement. Grants administered by the Oklahoma State Regents for Higher Education.

Award: Varies according to need.

Deadline: Priority deadline is February 1 for consideration for the subsequent fall semester.

Minority Doctoral Study Grant Program

The Oklahoma State Regents have set aside special funds to underwrite assistance programs for minority graduate students who are studying in public higher education institutions in Oklahoma with college teaching as a career objective. The Doctoral Study Grant Program is for students pursuing the doctoral degree with a commitment to teach in Oklahoma colleges and universities. For further information, contact the Oklahoma State Regents for Higher Education, 500 Education Building, State Capitol complex, Oklahoma City, OK 73105.

Minority Tuition Waivers

As part of a social justice policy enacted by the Oklahoma State Regents for Higher Education, minority nonresident graduate students are eligible for a waiver of their out-of-state tuition fee; however, they do not qualify for departmental assistantships. Eligible applicants should contact the associate dean or director of student academic services in the Graduate College prior to the beginning of each semester.

Water Resources Presidential Fellowships

The University Center for Water Research accepts applications for Presidential Fellowships in Water Resources. These fellowships are awarded for advanced study and research toward solving pressing water problems in Oklahoma, the region and the nation. Focus areas include water quality and quantity management and protection; efficiency of use, reuse and conservation of the resource; and legal, economic, social and institutional aspects of water resources management. Currently the recipients receive stipends of $950 per month, beginning in July. Fellowships are renewable each July 1, and may be continued up to three years, provided satisfactory progress is demonstrated.

To receive additional information concerning the fellowship program including application guidelines, contact the director of the University Center for Water Research, 003 Life Sciences East, Oklahoma State University, Stillwater, Ok 74078.

Student Employment

The Office of University Personnel Services provides assistance to OSU students seeking part-time employment. Students are informed of job opportunities on campus and in the Stillwater community. Applications are available in 407 Whitehurst. 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.

Miscellaneous Sources of Financial Aid

1. University and public libraries have information on federal, state and private sources of aid. Factors other than financial need are often taken into account.

2. Many companies and labor unions have programs to help defray the cost of advanced education for their employees or members of their families.

3. Students should check foundations, religious organizations, fraternities or sororities, town or city clubs, community and civic organizations such as the American Legion, YMCA, 4-H Clubs, Kiwanis, Jaycees, Chamber of Commerce, and the Masonic Lodge.

4. Organizations connected with a student's field of interest often provide scholarships. These organizations may be listed in the U.S. Department of Labor's Occupational Outlook Handbook, or a student can often find out more about these by contacting faculty members in the major field.

Departmental Scholarships

These awards are controlled by specific departments or those which require nomination from the department in behalf of the student. Individual departments may know if particular awards or scholarships are available in the discipline.

National Fellowships

1. Fulbright-Contact Office for Global Studies, 208 Life Science East, 405-744-5663.

2. National Science Foundation-Contact Graduate College, 202 Whitehurst, 405-744-6368.

Oklahoma State University Loans

OSU provides opportunities 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. The Funds Advance program provides up to a maximum of $200 per semester for the purpose of meeting educationally-related expenses. Additional information is available in the Office of Student Financial Aid in a computer software program called FINDS. Additionally, the Graduate College often has information on miscellaneous forms of financial aid. There is no centralized location for graduate student financial aid; therefore, the student should also contact the reference section of the library for information.

Special Programs

Certification Programs

Oklahoma State University offers State Department of Education-approved post-bachelor's certification programs for school counselors, psychomoters, 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 Certificate Program in Educational Administration (Emphasis on Standard Certification for School Superintendent)
- M.S. in Occupational and Adult Education (Emphasis in Human Resources 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.

At present, OSU does not offer any doctoral programs at UCT. Courses offered by OSU at UCT may apply as residence credit to doctoral degree programs that are available in Stillwater. Prior to enrollment in UCT courses, students should secure approval from their adviser concerning the appropriateness of any course relative to degree objective. Students should also be aware that substantial portions of doctoral degree programs require attendance in courses and participation in departmental programs in Stillwater.

Graduate Centers

Students make take one-half of the requirements for the master's degree at a Graduate Center provided they comply with the following conditions:

- 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 a faculty member of the graduate faculty teaching 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.

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 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 scale. The environmental science emphasis 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 programs 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 60-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. Specific requirements for the master's degree can be obtained from the program coordinator.

The Doctor of Philosophy Degree. To obtain the Ph.D. degree in environmental science, a student must propose and undertake a minimum of a 60-hour plan of study. The plan of study must include a minimum of 36 credit hours of course work that provides the student with expertise in understanding or solving a problem which is not normally addressed by a single discipline. The plan of study will reflect an emphasis in one of four thrust areas: 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 the 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.

Graduate research assistantships are occasionally available through faculty members participating in environmental science programs or through one of the several research institutions or centers on campus. The initial application should specify an interest in an assistantship.

Cooperating Departments

Agricultural Economics

Agricultural Engineering

Agronomy

Animal Science

Biochemistry

Botany

Chemistry

Civil Engineering

Curriculum and Instruction

Economics

Forestry (M.S. only)

Geography (M.S. only)

Geology (M.S. only)

Housing, Interior Design and Consumer Studies

Political Science (M.A. only)

Psychology

Sociology

Wildlife and Fisheries Ecology

Zoology

Steering Committee

Daniel D. Badger, Agricultural Economics

Sterling L. Burks, Zoology

Douglas C. Kent, Geology

James J. Lawler, Political Science

Edwin L. Miller, Forestry

Terence J. Mills, Curriculum and Instruction

John N. Veenstra, Civil Engineering

John D. Vitek, Program Coordinator, Geology

Sue E. Williams, Housing, Interior Design and Consumer Studies

(Specific requirements for degree programs can be obtained from the program coordinator in the Graduate College.)
Food Science
Animal Science
Professor and Head Robert Totusek, Ph.D.
Biochemistry
Professor and Head Roger E. Koepp, Ph.D.
Microbiology
Professor and Head Glenn W. Todd, Ph.D.
Food, Nutrition and Institution Administration
Professor and Interim Head Lea Ebro, Ph.D.

Food science is an interdisciplinary graduate program designed to provide an opportunity for students to acquire basic knowledge of food industry encompassing the biological and physical sciences. The increasing complexity of the problems involved in the production, processing, and utilization of food demands increased fundamental knowledge to solve these problems. There is 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 departmental 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.

Graduate Admission Requirements
Requirements are subject to departmental revision.

<table>
<thead>
<tr>
<th>Department/Major</th>
<th>Degree</th>
<th>GRE Gen Sub</th>
<th>GMAT</th>
<th>Miller Analogy (MAT)</th>
<th>Additional Requirements</th>
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<td>AGRICULTURE</td>
<td></td>
<td></td>
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<tr>
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<td>Agricultural Education</td>
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<td></td>
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<tr>
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<tr>
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<td>No entrance exam.</td>
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<tr>
<td>Crop Science</td>
<td>PhD</td>
<td></td>
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<td>No entrance exam.</td>
</tr>
<tr>
<td>Soil Science</td>
<td>PhD</td>
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<td>Animal Science</td>
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<td>No entrance exam.</td>
</tr>
<tr>
<td>Animal Breeding</td>
<td>PhD</td>
<td></td>
<td></td>
<td></td>
<td>No entrance exam.</td>
</tr>
<tr>
<td>Animal Nutrition</td>
<td>PhD</td>
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<td>No entrance exam.</td>
</tr>
<tr>
<td>Dairy Science</td>
<td>MS</td>
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<td>No entrance exam.</td>
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<td>Poultry Science</td>
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<td>No entrance exam.</td>
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<tr>
<td>Biochemistry</td>
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<td>2</td>
<td></td>
<td>American Chemical Society exams in chemistry.</td>
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<tr>
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<tr>
<td>Forest Resources</td>
<td>MS</td>
<td></td>
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<td>No entrance exam.</td>
</tr>
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<td>Horticulture</td>
<td>MS</td>
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<tr>
<td>Plant Pathology</td>
<td>MS, PhD</td>
<td>1</td>
<td>2</td>
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<tr>
<td>ARTS AND SCIENCES</td>
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<tr>
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<td>1</td>
<td>2</td>
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<td>No minimum score.</td>
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<tr>
<td>Chemistry</td>
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<td>2</td>
<td>2</td>
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<td>Entrance exams.</td>
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<tr>
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<td>MS</td>
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<td>2</td>
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<td>MS: 75 percentile</td>
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<td>Information Science</td>
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<td>minimum mathematical</td>
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<td>aptitude.</td>
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<td>PhD: 75 percentile</td>
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<td>minimum mathematical</td>
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<td>aptitude; 50 percentile</td>
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<td></td>
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<td>MA: 3.00 GPA; BA in</td>
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<td>English or equivalent for</td>
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<td>TESL or Technical</td>
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<td>Writing.</td>
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<td>PhD: 3.50 GPA; MA in</td>
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<td>No minimum score.</td>
</tr>
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<td>Geology</td>
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<td>2</td>
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</tr>
<tr>
<td>Health, Physical</td>
<td>MS</td>
<td></td>
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<td>No entrance exam.</td>
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<td>Education and</td>
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<td></td>
<td>No minimum score.</td>
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<tr>
<td>Recreation History</td>
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<td>1</td>
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<td></td>
<td>PhD</td>
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<tr>
<td>Mass Communications</td>
<td>MS</td>
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<td>No entrance exam.</td>
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<tr>
<td>Mathematics</td>
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<td>Applied Mathematics</td>
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<td>No minimum score.</td>
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<td>Microbiology</td>
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<td>No entrance exam.</td>
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<td>See department admission requirements.</td>
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<td>Philosophy</td>
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<td>Physics</td>
<td>MS, PhD</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Political Science</td>
<td>MA</td>
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</table>
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.

Agriculture

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 education, agronomy, animal science, entomology, forestry, horticulture and landscape architecture, and plant pathology.

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. 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 discipline as well as discipline interrelationships. The principal focus, however, is on an applied research concept and a broader program than is normally available with the specialized research degree.

A baccalaureate degree in agriculture or a related field is required for admission. The candidate must meet requirements for acceptance into the Graduate College and be recommended by the departmental graduate committee responsible for the program.

<table>
<thead>
<tr>
<th>Department/Major</th>
<th>Degree</th>
<th>GRE Gen Sub</th>
<th>GMAT</th>
<th>Miller Analogy</th>
<th>Additional Requirements</th>
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<tr>
<td>Psychology</td>
<td>PhD</td>
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<td>No minimum score. Need departmental application &amp; 3 letters of recommendation. GRE required if GPA less than 3.00.</td>
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<td>Sociology</td>
<td>MS, PhD</td>
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<td></td>
<td>3.00 GPA minimum &amp; 3 letters of recommendation. (English is second language, TSE: 220 minimum; TOEFL: 550 minimum.)</td>
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<tr>
<td>Speech and Language Pathology and Audiology</td>
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<td>GPA 3.25 or higher and GMAT score of minimum 525. 3 letters of recommendation and an essay.</td>
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<tr>
<td>Theater</td>
<td>MS, PhD</td>
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<td>GMAT required, high GPA, &amp; 3 letters of recommendation. 3 letters of recommendation. 3 letters of recommendation.</td>
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<tr>
<td>Statistics</td>
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<td>No entrance exam. GRE: 950, MAT: 47.</td>
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<td>Wildlife and Fisheries Ecology</td>
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<tr>
<td>Zoology</td>
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<td>MS: no entrance exam. Eds &amp; EdD:MAT or GRE.</td>
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<td>BUSINESS ADMINISTRATION</td>
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<td>emphasis in:</td>
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<td>Accounting</td>
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<td>Management</td>
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<td>Marketing</td>
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</tr>
<tr>
<td>Economics</td>
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<td>EDUCATION</td>
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</tr>
<tr>
<td>Applied Behavioral Studies</td>
<td>MS, PhD, EdD</td>
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<td>Counseling and Student Personnel</td>
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</tr>
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<td>Curriculum and Instruction</td>
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<tr>
<td>Higher Education</td>
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<tr>
<td>Occupational and Adult Education</td>
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<td>Distributive Education</td>
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<td>Industrial Arts Education</td>
<td>MS</td>
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<tr>
<td>Technical Education</td>
<td>MS</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Trade &amp; Industrial Education</td>
<td>MS</td>
<td></td>
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</tbody>
</table>
### Oklahoma State University

#### Department/Major | Degree | GRE Gen Sub | GMAT | Miller Analogy (MAT) | Additional Requirements
--- | --- | --- | --- | --- | ---
**ENGINEERING**
Agricultural Engineering | MAgE, MS, PhD | | | | No entrance exam.
Architecture | MArchE | | | | See specific school admission requirements.
Architectural Engineering | MChemE, MS, PhD | | | | No entrance exam.
Chemical Engineering | MCivilE, MS, PhD | | | | No entrance exam.
Civil Engineering | MEnviE, MS | 2 | 2 | | No entrance exam.
Environmental Engineering | MElecE, MS, PhD | | | | No entrance exam.
Electrical Engineering | MGenE, MS, PhD | | | | No entrance exam.
General Engineering | MIE&Mgmt, MS, PhD | | | | No entrance exam.
Industrial Engineering and Management | MMEchE, MS, PhD | 2 | 2 | | No entrance exam.
Mechanical Engineering | MMechE, MS, PhD | | | | No entrance exam.
**HOME ECONOMICS**
Clothing, Textiles and Merchandising | MS | | | | No entrance exam.
Family Relations and Child Development | MS | 1 (for FRCD emphasis) | 3 | | No entrance exam for other areas.
Food, Nutrition and Institution Administration | MS | | | | No entrance exam for other areas.
Home Economics | PhD | 1 (for FRCD emphasis) | 3 | | No entrance exam for other areas.
(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.)
Home Economics Education and Community Services | MS, EdD | | | | No entrance exam.
Housing, Interior Design and Consumer Studies | MS | | | | No entrance exam.
**INTERDISCIPLINARY**
Environmental Science | MS, PhD | | | | No entrance exam; 575 TOEFL.
Food Science | MS, PhD | | | | No entrance exam.
Manufacturing Systems Engineering | MMSE | | | | No entrance exam.
Natural Science | MS | | | | No entrance exam.
**VETERINARY MEDICINE**
Physiological Science | MS, PhD | 1 | 1 | | GPA last 60 hrs. B.S. X GRE must equal 3000 or above for MS or 3150 or above for PhD.
Veterinary Parasitology | MS, PhD | 1 | 1 | | General score on GRE must equal 3000 or above for unqualified admission.
Veterinary Pathology | MS, PhD | 1 | | | No minimum score.
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 the 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 office.

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 (TEP) 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 any 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 has been or will be admitted to a program leading to an advanced degree or that the student will be able to obtain a graduate degree. Opportunities for receiving graduate credit and graduate degrees are dependent on the admission status granted to the student.

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, academic participation may be terminated or the 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 faculty of the department or program and the dean of the Graduate College
to ascertain admmissibility to the degree program.

3. 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 "unclassified students" in the Graduate College on the basis of educational services, other than degrees, that can be extended to them in meeting their individual needs.

1. The category of unclassified graduate students may include individuals working on teacher certification and post-baccalaureate objectives other than a graduate degree.

2. No credit earned under this classification can be used toward a graduate degree at Oklahoma State University.

Probation or Provisional Status. Applicants who are graduates of accredited colleges and universities who have attained less than an acceptable grade-point average in all undergraduate work may be admitted provisionally or on probation on recommendation of the major department at Oklahoma State University and concurrence by the dean of the Graduate College. Alternatively, a student who has been in full graduate standing or special student status may be placed on probation or continued provisionally if academic performance in courses taken in a graduate status at Oklahoma State University falls below a "B" average. Students with acceptable academic records but without the background necessary for a particular degree program may also be admitted provisionally. Students admitted provisionally or on a probationary basis may be granted full graduate standing after performing at an acceptable academic level. Failure to meet required academic levels while in a probationary status will result in dismissal from the Graduate College. International students holding F-1 visas are not eligible for provisional admission.

Transfer of Graduate Credits

Transfer of graduate credits to the Graduate College is possible only when the student was formally admitted to the graduate college at another accredited institution and the course(s) is certified as graduate credit by that institution.

The work must be recommended by the adviser as a part of an approved plan of study. The acceptance of transferred work requires the recommendation of the student's advisory committee and approved by the dean of the Graduate College at the time a program of study is planned. A maximum of nine credit hours with a grade of "B" or better in each course can be accepted as transfer credits toward a degree.

Departmental or Program Requirements

Departmental or program requirements are in addition to the general requirements. The decision is made within the department or major field regarding the substitution for OSU requirements of similar work taken at another institution.

A student who desires further information about departmental and admission and curricular requirements should write to the department in which he or she desires to major.

Readmission to the Graduate College

A prospective student must enroll for courses at OSU within a year after his or her admission date to retain active status. A graduate or prospective student who does not enroll within one year must reapply for admission. A student who interrupts enrollment for one year must be readmitted and will then be subject to the regulations in effect at the time of readmission.

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. An advance fee payment is required of all new and readmitted students.

Students in the Graduate College may 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. Students must have no academic or financial holds on their enrollment and must have the required 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 405-744-6388.

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 sum-
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 and Financial Assistance. For the purpose of receiving monetary assistance through the Office of Financial Aid, the amount of the award is related only to the total number of credit hours in which enrolled. Certifiable enrollment status, based upon a combination of enrollment and employment, only assists with the deferral of loan repayments, never qualification for aid, which is based solely on enrollment.

Enrollment During the Research Phase

Because enrollment reflects the involvement of University faculty members, the graduate student must maintain continuous enrollment in thesis and/or problems courses for credit 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 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.

Academic Regulations

Graduate-credit Courses

Courses numbered 3000 and 4000 that are identified by the asterisk in the "Catalog" can 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.

Courses 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 any time prior to the last date on which a course may be added. 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 card. Completion of that card initiates clearance procedures 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.

**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 semester may secure a statement from that Office. A graduate student who does not complete the requirements in time to receive the degree at the end of the semester may secure a statement from that Office. A graduate student who does not complete the requirements in time to receive the degree at the end of the semester may secure a statement from that Office.

**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
- MEEe: Master of Electrical Engineering
- MEnvirE: Master of Environmental Engineering
- MGene: Master of General Engineering
- MEIeMgmt: Master of Industrial Engineering 
  & Management
- MMse: Master of Manufacturing Systems Engineering
- MmechE: Master of Mechanical Engineering
- MS: Master of Science

**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, MArch
- 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, MEEeC, MS**

**English, MA**

**Entomology, MS**

**Environmental Engineering, MENVirE, 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, MIEIIeMgmt, MS**

**Manufacturing Systems Engineering, MMSe**

**Mass Communications, MS**

**Mathematics, MS**

**Mechanical Engineering, MmeCHE, MS**

**Microbiology, MS**

**Natural Science, 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**

**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 coursework 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.

**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 a semester and conduct the study or research under the direction 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.

**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.
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 by two other members of the graduate faculty in the major department, and approved by the dean of the Graduate College.

Students seeking 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 Oklahoma State University as presented on the plan of study to meet requirements for the master's degree.

Before receiving a master's degree, the student must have completed in the major department or field a minimum of 16 semester credit hours above the prerequisites required for graduate work in that subject or field. A student who lacks 10 semester credit hours or fewer of the prerequisites required by the major department or field may count these credits as part of the requirements of the degree if the courses are on a complete study plan approved by the head of the department before it is presented to the dean of the Graduate College.

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 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

<table>
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<tr>
<th>Procedure</th>
<th>Initiate through</th>
<th>Time</th>
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<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>
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<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>
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<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>
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<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 for resident students and prior to enrolling for the 9th credit hour for extension students.</td>
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<tr>
<td>5. Proceed with course work and research assignment.</td>
<td>Adviser</td>
<td></td>
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<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>
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<tr>
<td>7. Take comprehensive written examinations as required by major department.</td>
<td>Adviser</td>
<td></td>
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<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>
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9. Examining committee members formally acknowledge receipt of the thesis or report and concur in request to administer final examination on candidate (Form T-1).

Comm
Dean

10. Committee chairman notifies Graduate College of the examination results immediately following conclusion of the examination (Form T-2).

Adviser
Dean
Deadlines published yearly.

11. 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 Graduate College makes the final decision on acceptance of the thesis or report. Candidate submits at least three approved copies of the abstract or one copy of a report and six approved copies of the abstract, along with clearance check (Form T-3) signed by the student and the adviser. Adviser certifies that all requirements have been met for non-thesis or report student. Forms for scheduling the final examination and notification of the completion of departmental requirements can be obtained from the Graduate College after the Application for Diploma card has been processed.

Adviser
Dean
Deadlines published yearly.

12. Pay binding fee in the Bursar's Office and return form to the Graduate College.

GCO
Form to be obtained from the Graduate College after the thesis has been formally accepted by that office.

13. Arrange for cap, gown and hood at Student Union Bookstore and attend Commencement.

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.

If 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 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.

**Report.** The student must submit to the Graduate College one copy of a report, with six copies of the abstract. It must be bound in a pressboard cover as described in the Graduate College Style Manual. By paying the binding fee, the student may have extra copies of the report bound by the University. The final copy of the report, accompanied by Form T-3, must be submitted to the Graduate College no later than the stated deadline (see "Graduate College Calendar").
**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 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.

Failure to maintain continuous enrollment requires submission of a new application for readmission to the graduate program. If readmitted, all requirements in effect at the time of readmission must be completed.

**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 Intention form to become a candidate for the degree. The Notice of intention form may be obtained in 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 preparing 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 of the progress of his or her work.

Preliminary Conference. As soon as the student is notified that an advisory committee has been appointed, 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, and file 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 doctoral 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. The plan must be submitted, together with the thesis credit, not less than six months before the degree is granted.

The student must have an approved plan of study on file with the dean of the Graduate College before being admitted to candidacy.

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.

A dissertation (doctoral thesis) is required for the Ph.D. degree in all fields. A master's thesis may be accepted as a dissertation in certain fields, provided it contains an advanced level of knowledge that facilitates research and contributes 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 written or oral. The examination must be passed not less than six months before the degree is granted. 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 all doctoral candidates. 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 date (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 requesting 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 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 date (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.

Time Limit. Students are expected to complete the requirements of the Ph.D. degree within six years. Any time beyond the six-year limit of the Ph.D. is considered a non-degree status. Note: Time limitation for the Master of Science by Research or Master of Science by Non-Thesis (M.S.R. or M.S. by Non-Thesis) is 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.

Failure to maintain continuous enrollment requires submission of a new application for readmission to the graduate program. If readmitted, all requirements of the Graduate College and the department in effect at the time of readmission, must be completed.

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.

Basic Requirements. The minimum time required for the doctor's degree is 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. Courses at the 5000 and 6000 level should make up approximately 75 percent of the plan of study and must include 10 hours for the doctoral dissertation. The student must register for the dissertation in the same way he or she registers for other courses. 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. The student can secure an application form from 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 Doctor of Education degree. The student planning to seek the Doctor of Education degree must complete a personnel folder which includes a vita, 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 his or her department head to determine which tests are required and to obtain materials concerning the personnel folder.

When the student's personnel folder is complete, the graduate review committee will review the student's records and recommend to the dean of the Graduate College whether or not the student should be admitted. The dean of the Graduate College will inform the student by letter of admission status.

Notice of Intention. Before taking additional courses after completing the requirements for a master's degree, a student who expects to work for the Doctor of Education degree should file a Notice of Intention in the Graduate College to become a candidate for the degree. 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 enrollment beyond 30 credit hours of course work above the master's degree.

<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.)</td>
<td>Dean Dean</td>
<td>Complete 30 days prior to enrollment (60 days prior for international students).</td>
</tr>
<tr>
<td>2. Secure assignment of temporary adviser from major department head and enroll.</td>
<td>DH &amp; TA Dean</td>
<td>Prior to mid-semester of first semester of graduate enrollment or second summer enrollment.</td>
</tr>
<tr>
<td>3. File Notice of Intention to become a candidate for the degree. Obtain forms in Graduate College.</td>
<td>Dean</td>
<td>Prior to qualifying examination.</td>
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<tr>
<td>4. Provide temporary adviser with information as required to evaluate admissibility to program.</td>
<td>TA Dean</td>
<td></td>
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<tr>
<td>5. On favorable action of appropriate Graduate Faculty group with respect to admission to program, request the appointment of advisory committee.</td>
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<tr>
<td>6. Prepare plan of study with assistance of committee. Submit two approved copies to Graduate College and two to the advisory committee.</td>
<td>Comm Dean</td>
<td>Prior to enrollment date (see &quot;University Calendar&quot;) during second full semester of enrollment beyond master's degree.</td>
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<tr>
<td>7. Fulfill foreign language requirement or attain other required proficiencies.</td>
<td></td>
<td>Prior to qualifying examination.</td>
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<tr>
<td>8. Complete major portion of course work and plan thesis program with committee. Submit copy of approved thesis outline to Graduate College.</td>
<td>Ch Dean</td>
<td>Prior to qualifying examination.</td>
</tr>
<tr>
<td>9. Apply for and take qualifying examination.</td>
<td>Ch Dean</td>
<td>As early in the doctoral program as feasible.</td>
</tr>
<tr>
<td>10. Submit results of qualifying examination and/or application for admission to candidacy (Form G-4).</td>
<td>Comm Dean</td>
<td>Not less than six months prior to Commencement in which degree will be conferred.</td>
</tr>
<tr>
<td>11. 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.</td>
<td>Comm Dean</td>
<td>At the beginning of the semester or summer session in which degree is to be conferred.</td>
</tr>
</tbody>
</table>
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 Deadlines published yearly. Comm Dean

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 Deadlines published yearly. Comm Dean

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.

Temporary Adviser. Upon receiving a Notice of Intention for a student to become a candidate for the Doctor of 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 of not fewer than four members. The duties of the advisory committee consist of (1) advising the student, (2) assisting the student in preparing a program of study, (3) preparing and administering the qualifying examination, (4) assisting in planning and conducting the research, (5) supervising the writing and subsequent approval of the dissertation, and (6) conducting the final examination.

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 10 hours thesis credit. Forms for preparing the plan of study will be sent to the student by the Graduate College. The plan of study must include a minimum of 60 hours beyond the master's degree. Courses from the master's degree are not listed on the doctoral plan of study.

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.

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 candidate should refer to the "Doctor of Philosophy" section on dissertations and submission procedures throughout 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.

Failure to maintain continuous enrollment requires submission of a new application for readmission to the graduate program. If readmitted, all requirements of the Graduate College and the department in effect at the time of readmission, must be completed.

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 of 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) 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 practical 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. ACARSON, B.S. (Univ. of Nebraska), M.S. (Univ. of Colorado), Ph.D. (ibid); Professor of Physics; 1986, 1977.

ALAN C. ADOLPHSON, B.A. (Western Univ., Cairo), M.S. (Univ. of Illinois), Ph.D. (ibid); Professor of Administrative Services and Associate Dean of the College of Business Administration; 1977, 1967.

DONALD J. BANKS, B.S. (O.S.U.), M.S. (ibid), Ph.D. (Univ. of Georgia); Professor of Sociology; 1987, 1976.

JOSEPH F. BYRNES, B.A., B.D. (Montfort Seminary), M.A. (Univ. of Chicago); Professor of Religious Studies; 1982, 1972.

MICHAEL BRAUNSON, B.S. (Illinois Benedictine College), M.A. (Arizona State Univ.), Ph.D. (ibid); Associate Professor of Industrial Engineering and Management; 1985.

JAMES E. BREAZILE, B.S. (Univ. of Missouri), D.V.M (ibid), Ph.D. (Univ. of Minnesota); Professor of Physiological Science and Director of Laboratory Animal Resources; 1966, 1978.

ANTHONY EDWARD BROWN, B.A. (Baylor Univ.), M.P.A. (Univ. of Tennessee), Ph.D. (ibid); Associate Professor of Political Science and Government; Professor of Political Science and Government; 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.


ALAN W. BRUNKEN, B. Arch. (O.S.U.), M. Arch. (Massachusetts Inst. of Technology); Professor of Architecture; 1986, 1973.

GERALD HENRY BRUSEWITZ, B.S. (Univ. of Wisconsin), M.S. (Oklahoma State Univ.), Ph.D. (Michigan State Univ.); Professor of Agricultural Engineering; 1980, 1969.

DAVID S. BUCHANAN, B.S. (North Dakota State Univ.), M.S. (Univ. of Nebraska), Ph.D. (ibid); Professor of Animal Science; 1988, 1980.

KAY SATHER BULL, B.S.B.A. (Roosevelt Univ.), M.B.A. (ibid), Ph.D. (Univ. of Wisconsin); Professor of Applied Behavioral Science; 1988, 1973.

RICHARD A. BUNCE, B.S. (Marietta College), Ph.D. (Univ. of Wisconsin, Madison); Associate Professor of Chemistry; 1988, 1983.

HERMANN G. BURCHARD, Dipl.-Math. (Univ. of Hamburg), Ph.D. (Purdue Univ.); Professor of Mathematics; 1977, 1972.

STERLING LEON BURKS, B.S. (Southwestern Oklahoma State Univ.), M.S. (O.S.U.), Ph.D. (ibid); Professor of Zoology; 1986, 1978.

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; 1975, 1970.


JOSEPH F. BYRNE, B.A., B.D. (Montfort Seminary), M.S. (Univ. of Notre Dame, Chicago), Ph.D. (Univ. of Chicago); Professor of Religious Studies; 1988, 1976.

JOHN LEVIS CADEL, B.S. (Texas A & I Univ.), Ph.D. (O.S.U.); Professor of Agronomy; 1986, 1977.
H. STEPHEN CALDWELL, A.B. (Hanover College), M.S. (DePauw Univ.), Ph.D. (Purdue Univ.); Professor of Psychology; 1980, 1971.


LOWELL CANEDAY, B.A. (Le Tourneau College), M.A. (Univ. of Wyoming), Ph.D. (Univ. of Minnesota). Associate Professor of Health, Physical Education and Leisure, Coordinator, Leisure, and Coordinator of Graduate Studies; 1986, 1981.


FRANK L. COLLINS, B.S. (N.W. State Univ. of Illinois), M.S. (Iowa State Univ.), Ph.D. (Iowa State Univ.); Associate Professor of Agronomy; 1981, 1975.

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GARY J. BEEBY, B.S. (Phillips Univ.), M.A. (Univ. of Illinois); Assistant Professor of Speech and Language Pathology and Audiology; 1974.
RONALD S. BEER, B.S. (Illinois State Univ.), M.A. (Michigan State Univ.), Ph.D. (Kent State Univ.); Associate Professor of Educational Administration and Higher Education and Vice-President of Student Services; 1980.
CAROL L. BENDER, B.S. (Texas Tech Univ.), M.S. (Oregon State Univ.), Ph.D. (Univ. of California, Riverside); Assistant Professor of Plant Pathology; 1985.
DENNIS EARL BERTHOLF, B.S. (Univ. of Kansas), M.A. (New Mexico State Univ.), Ph.D. (ibid); Professor of Mathematics; 1988, 1968.
TERRENCE D. BIDWELL, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Assistant Professor of Agronomy; 1988.
DAVID M. BILLEAUX, B.S.Ed. (Illinois State Univ.), M.A. (Univ. of Kansas), M.Phil. (ibid), Ph.D. (ibid); Assistant Professor of Political Science; 1986.
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; 1988, 1977.
GEORGE BAKER BOKORNEY, B.S. (O.S.U.), M.S. (ibid), Ed.D. (Univ. of Oregon); Professor of Hotel and Restaurant Administration; 1983, 1971.
MARY S. BROSKE, 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 Science; 1966, 1955.
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. (ibid); Professor of Veterinary Medicine and Surgery; 1984, 1979.
DONALD S. BURNETT, M. Arch. (Univ. of Northern Colorado, Greeley), Ph.D. (O.S.U.); Associate Professor of Clothing, Textiles and Merchandising; 1984.
LOWELL M. BUSMAN, B.S. (Southwest State Univ. Minnesota), M.S. (Univ. of Minnesota), Ph. D. (Iowa State Univ.); Assistant Professor of Agronomy; 1987.
LOUIS JOHNSON, B.S. (Massachusetts Inst. of Technology), M.S. (ibid), Ph.D. (ibid); Associate Professor of Electrical and Computer Engineering; 1983, 1979.

MARK E. JOHNSON, B.A. (Univ. of California, Santa Barbara), M.A. (ibid), Ph.D. (ibid); Assistant Professor of Applied Behavioral Studies; 1985.

EDWARD JONES, B.A. (Central Connecticut), M.A. (Ohio Univ.), Ph.D. (ibid); Assistant Professor of English; 1987.

H. JON JONES, B.A. (Thiel College), M.A. (Bell State Univ.), Ed.D. (ibid); Assistant Professor of Curriculum and Instruction; 1989.

JERRY J. JORDAN, B.S. (Central State Univ.), M.S. (Univ. of Oklahoma), Ed.D. (Temple Univ.); Associate Professor of Health, Physical Education and Leisure; 1985.

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KENNETH J. KISER, B.A. (O.S.U.), M.S. (ibid), Ph.D. (Ohio State Univ.); Associate Professor of Sociology; 1977, 1970.

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JAMES F. KNIGHT, B.Arch. (O.S.U.), M.Arch. (Univ. of Houston); Professor and Head of the School of Architecture; 1990, 1979.

NORMA SUE KNIGHT, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Associate Professor of Food, Nutrition and Institution Administration; 1987, 1980.

ROBERT P. KNUTTENUS, B.A. (Beloit College), B.Ed. (I.A.) (Southern Illinois Univ.), Ph.D. (ibid); Assistant Professor of Sociology; 1988.

PAULINE W. KOPECY, B.B.A. (Southwestern Univ.), M.Ed. (Univ. of Texas), Ph.D. (Univ. of Houston); Associate Professor of Economics; 1976, 1967.

BERNICE H. KOPEL, B.S. (Univ. of Minnesota), M.S. (North Carolina Univ.), Ed.D. (O.S.U.); Associate Professor of Food, Nutrition and Institution Administration; 1979, 1970.

JOHNIE ROBERT KROPP, B.S. (O.S.U.), M.S. (ibid), Ph.D. (ibid); Professor of Animal Science; 1988, 1975.

FRANK ALLEN KULLING, B.S. (Univ. of Iowa), M.S. (Pennsylvania State Univ.), Ed.D. (O.S.U.); Assistant Professor of Health, Physical Education and Leisure; 1986, 1985.

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CARL D. LATINO, B.S. (City College of the City Univ. of New York), M.S. (Pennsylvania State Univ.), Ph.D. (ibid); Associate Professor of Engineering; 1986.

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CHARLES L. LEIDER, B.S. (Michigan State Univ.), M.P. (Iossc Univ.), Ph.D. (ibid); Associate Professor of Horticulture and Landscape Architecture; 1985.

JERROLD K. LEONG, B.S. (Cornell Univ.), M.P.S. (ibid), M.S. (Florida International Univ.), M.S.E. (Hawaii), Ph.D. (ibid); Associate Professor of Food, Nutrition and Institution Administration; 1985.

DAVID K. LEWIS, B.S. (Univ. of Minnesota), M.P. (Yale Univ.), Ph.D. (Oxford Univ.); Associate Professor of Forestry; 1982.

PHIL W. LIN, B.S. (Univ. of Texas, Austin), Ph.D. (ibid); Associate Professor of Foreign Languages and Literatures; 1982, 1973.

ROSS O. LOVE, B.S. (Cornell Univ.), M.S. (Michigan State Univ.), Ph.D. (ibid); Associate Professor of Agricultural Economics; 1989, 1983.

HUIZHU LU, B.S. (Fuden Univ.), M.S. (Univ. of Oklahoma), Ph.D. (ibid); Associate Professor of Computing and Information Science; 1989, 1985.

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DAVID E. MANDEVILLE, B.S.E. (General Motors Institute), M.S.E. (Purdue Univ.), Ph.D. (ibid); Associate Professor of Industrial Engineering and Management; 1985.

LISA A. MANTINI, B.S. (Univ. of Pittsburgh), M.S. (Boulder); Ph.D. (ibid); Assistant Professor of Marketing; 1979, 1975.

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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.

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VIRGINIA LEWIS MARSDEN, B.S. (Central Missouri State College), M.A. (Colorado State College of Education); Associate Professor Emeritus of Education; 1975, 1953.

GLADYS BOECK MARSHALL, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Family Relations and Child Development; 1971, 1947 (1939-43).

EVANGIE McGLON, B.S. (Central State Univ., Oklahoma), M.T. (ibid), M.Ed. (ibid), Ph.D. (Univ. of Oklahoma); Associate Professor Emeritus of Applied Behavioral Studies; 1984, 1978.


LOU S. MORRISON, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Plant Pathology; 1971, 1948.


JOHN DAVIS NAFF, 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 Theriogenologist Specialty Board in Veterinary Medicine); Professor Emeritus of Veterinary Medicine and Surgery; 1984, 1974.

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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.


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.

EMIL EDWARD SEBESTA, B.S. (South Dakota A&M College), M.S. (O.S.U.), Ph.D. (Cornell Univ.); Professor Emeritus of Agronomy; 1987, 1951.

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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.


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.

CHRIS G. WHITE, B.S. (O.S.U.), M.S. (ibid); Assistant Professor Emeritus of Agricultural Education; 1968, 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 1-3 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 2012. Prerequisites are listed in the following manner:

Prerequisites: Either A or both B and C
Prerequisites: A and B or C

Both A and B, or C required

**Abbreviations Used**

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<th>Abbreviation</th>
<th>Description</th>
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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.

3203 Cost Accounting. Prerequisite: 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.


3403 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. Prerequisite: 3603. Special topics, projects and independent study in accounting.

4013 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 and 3603. Integrative course in cost and management accounting; use of accounting information for internal decision making.

4301 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.

4453 EDP Auditing. Prerequisite: 4503 or consent of instructor. EDP auditing as it applies to the business environment. Impact of computer-based systems on cost control and auditing, total systems control analysis, and specific EDP auditing techniques as they apply to computer-based systems.

4501 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 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 and other entities in their capacity as corporate shareholders.

5053 Seminar in Corporate Taxation. Prerequisites: graduate standing and 5013 or consent of instructor. Federal income tax law applicable to corporations and to other entities in their capacity as corporate shareholders.

5103 Seminar In Contemporary Accounting Theory. 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.
3203 Air Force Leadership. Lab 1. The individual as a leader in the Air Force environment; individual motivational and behavioral processes, leadership, communication, and group dynamics.

3204 Air Force Management. Lab 1. The individual as a manager in the Air Force environment; basic managerial processes, organizational and personal values, management of forces in change, organizational power, politics and managerial strategy and tactics discussed.

3504 Summer Training Unit. Prerequisite: consent of PAS. Practical training on an Air Force base. Junior officer training, familiarization training in most functional aspects of a typical Air Force base. Includes career orientation, small arms firing and flight orientation rides.


4402 Applied Officership Practicum. Prerequisite: consent of PAS. Students spend from two to three weeks on an Air Force base working in their intended specialty under supervision of experienced officer. Leadership and management principles applied to day-to-day experiences.

4505 Flight Instruction Program. Lab 3. Prerequisite: consent of PAS. Includes academic and flying phase. Flight characteristics, meteorology, navigation, FAA regulations and radio procedures. Approximately 25 hours flying time.

AGRICULTURAL ECONOMICS (AGEC)

1114 Introduction to Agricultural Economics. Economic theory of production, marketing and consumption of agricultural products. The role and structure of agriculture in the American economy. Policies to achieve efficiency and welfare goals in agriculture.

2103 (SI)Principles of Economics Applied to Agriculture. relating agricultural 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, production credit associations, federal land banks, soil conservation service, and other agricultural related firms. Credit will not substitute for required courses. Graded on pass-fail basis.

3205 Agricultural 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. Indices, graphics, budgeting, discounting, basic statistical measures, use of microcomputers, and 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: 1114, and ACCTG 2103. Managerial functions and application to agricultural firms. The acquisition, organization and management of personal financial assets 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: 1114, 3213 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.

3422 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 analysis of economics and policies. Demand and supply of natural resources, entitlements, ownership rights, government regulation.

3603 Agricultural Finance. Prerequisites: 3413, ACCTG 2103. Farm financial management; preparation and analysis of net worth, cash flow and income statements, including microcomputer applications; financial intermediaries; serving agriculture; procedures for evaluating investments; alternative means of acquiring control of farm resources.

3900 Special Problems in Agricultural Economics. 1-3 credits, maximum 3. Directed study of selected agricultural economics topics.

4212 Agricultural Marketing and Prices. Prerequisites: 3203, 3213 and 3303. Agricultural marketing, with emphasis on system-wide approaches. Economic tools and techniques for making decisions.

4323 Cooperative Organization and Management. Prerequisite: 3303 or 3313. Principles, 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 theory of trade and monetary flows for 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.

4405 Farm and Ranch Management II. Prerequisites: 3603 and MATH 1513. Production planning with linear programming and other tools and methods of planning under uncertainty; accounting and finance of resources 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. Prerequisite: 1114 or ECON 2123. Economic, social and political factors relating to conservation, natural resource development and environmental quality. Legislation and role of governmental 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 three approaches to value: Determining the feasibility and profitability of land purchases.

4703 American Agriculture 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; career exploration; agriculture in the economics of the nation and the world. Individual seminar reports and group discussion of reports.

4990 Problems of Agricultural Economics. 1-6 credits, maximum 6. Prerequisite: 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.

5010* Research Methodology. The philosophical bases for research methods used in agricultural economics. Alternative research methods compared. Alternative approaches to planning, managing and performing research.

5020 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 cooperation and advising. 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.

5030 Advanced Agricultural Economics. Prerequisites: 1114 and 3303. Study of agricultural economic problems in depth; operational and pricing efficiency; organizational and personal values, managerial strategy and tactics discussed.

5101 Agricultural Economics 147
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5403* Production Economics. Prerequisite: 5103. Analysis of micro static production economics problems; factor-prod-uct relationships and cost-product relationships; functional forms for technical unit and aggregate production functions; maximizing and minimizing choice rules; firm cost structure; scale relationships.

5503* 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: 3603. Financial structure of agriculture, firm financial planning and management, financial intermediation in agriculture and agricultural finance in developing countries.

5703* Economics of Agriculture and Food Policy. Prerequisite: 5100. A study of the application of welfare criteria and economic analysis to agriculture, food and rural development problems and policies.

5713* Rural Regional Development. Prerequisite: 5103. Concepts of rural 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. Economics 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.

5733*International Agricultural Policy and Development. Review and evaluation of agricultural trade and development policies emphasizing developing countries. Objectives, constraints and instruments of national food and agricultural trade policy in an interdependent world. Efficiency, stability, distribution, equity and market structure in commodity trade.

5900* 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 optimization theory followed by applications to microeconomic theory.

6113* Systems Analysis for Agriculture. Prerequisites: 5103, STAT 4043, knowledge of BASIC or FORTRAN. Methods and modeling of the presented 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. Prerequisite: 5103, and STAT 4203. Application of econometric techniques to agricultural economic problems, theory and estimation of structural economic parameters.

6213* Advanced Econometrics. Prerequisite: 6203 and MATH 3013. General presentation of large sample theory followed by applications to general linear models, generalized least squares, ARIMA processes, and panel models, time series models, and probability models.

6300* Agricultural Marketing Seminar. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Current developments in theory, techniques for evaluating marketing behavior, market legislation and market development.

6303* Advanced Agricultural Marketing. Prerequisite: 5303. Marketing theory, market structure and performance, government 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. Advanced applications of microeconomic theory and methodology to problems of resource efficiency.

6403* Advanced Production Economics. Prerequisite: 5403. Micro dynamic production economics problems 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 nonlinear programming models in production economics models.

6700* Agricultural Policy and Rural Resource Development Seminar. 1-2 credits, maximum 2. Frontier issues in development policy, natural resources and rural development.

AGRICULTURAL EDUCATION (AGED)

3103* Foundations and Philosophies of Teaching Agricultural Education. Lab 2. Prerequisite: 21 semester credit hours of agriculture with a 2.50 GPA. Roles and responsibilities of the agricultural education teacher; types of program offerings; steps of the teaching-learning process; place of agricultural education 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 agricultural education program policies, FFA chapter advisement, planning and managing the instructional program, identification and completion of records and reports required of a teacher of agricultural education in Oklahoma.

3303* 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. Enabling legislation, program areas, teaching methods, program evaluation, youth programs, exchange service, and program administration. Special emphasis on entry-level positions and responsibilities of each.

3510 Laboratory and Clinical Experiences in Agricultural Education. 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 and Skills of Teaching and Management in Agricultural Education. Lab 2. Prerequisites: 3203, junior standing in the College of Agriculture, full admission to the University Teacher Education program and concurrent enrollment in 4200. Facets of the teaching-learning process including teaching methods, basic teaching skills, appropriate classroom management techniques and motivational techniques and ideas. Preparation for student teaching which is to be completed during the same semester.

4200 Student Teaching in Agricultural Education. 10 credits. Lab 30. Prerequisites: 3203, junior standing in the College of Agriculture, full admission to the University Teacher Education program and concurrent enrollment in 4103. Full-time directed experience in an approved program setting. Application of methods and skills in agricultural education as related to selecting, adapting, utilizing, evaluating, curricular 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 groups and organization and operation of school systems.

4300 Agricultural Education Internship. 3-10 credits, maximum 10. Prerequisite: professional course sequence and consent of adviser/internship coordinator. Supervised full-time internships in approved county extension offices, businesses or governmental agencies, for students preparing for careers in agricultural education. Not intended for teacher certification. Maximum credit requires a 12-week internship in addition to a report.

4713* International Programs in Agricultural Education and Extension. World hunger and its root causes. The function of international agencies, organizations, foundations and churches in improving the quality of life for people of the developing nations. Roles of agricultural education and extension at all levels for enhancing the effectiveness of developing countries programs of rural development and adult education.

4990* Seminar and Problems in Agricultural Education. 1-3 credits, maximum 6. Small group and 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.

5100* Organizing Curriculum and Programs of Agricultural Education. Role of organizational theory and methodology in planning and community agricultural needs as bases for localizing, personalizing and utilizing a basic core curriculum and other components essential to effective local agricultural education programs.

5122* Adult Education: Organization and Method. Determining adult education needs and interest of 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 implementation and relative effectiveness. Result of demonstration, method demonstration, meetings, tours, field days and exhibits.

5402* Young Farmer Organizations. Purposes and objectives of young farmer groups. Procedures for establishing and operating local chapters with emphasis on the role of the agricultural education teacher as adviser. Determining educational needs and interests of members. Securing and organizing information for individual and group instruction, planning teaching activities. Tours and educational trips to observe programs in operation.

5500* Directing Programs of Supervised Experience. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Determining the extension needs and opportunities of individual students. Planning for supervision of agricultural education training programs and 4-H club projects of the developing programs in agriculture, agricultural businesses and personal and community agricultural organizations.

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 organizations and groups.


5822* Advanced Methods of Teaching Agriculture. Developing facility in the use of conferences, demonstration trips, individual instruction, laboratory projects, supervised or directed study, surveys, visual aids and forms of programmed learning.

5862* Curriculum Design and Methodology for Alternative Agriculture in the Classroom. The methodology of development and utilization of curriculum for instructional programs focusing upon alternatives in agriculture and agricultural enterprises. Resources and components of a curriculum for teaching about new and emerging occupations and careers in agriculture.

*Approved for Graduate Credit
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.


2012 Agricultural Energy Conversion. Prerequisite: PHYS 2114. Energy use patterns in the U.S. food and fiber system, supply and demand for energy from various sources, thermodynamics of energy sources, and environmental limitations of energy systems.


3023 Instruments and Controls. Lab 2. Prerequisite: ENGR 1412, ENGSC 2613. Transducers, signal conditioning, read-out instruments, and electrical controllers. Assembly language programming, interfacing and applications of micro-computers in agriculture.

4013 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.

5030 Engineering Practice. 1-12 credits, maximum 12. Prerequisite: S. degree in agricultural engineering. The identification, analysis and synthesis of an authentic problem in agricultural and biological engineering. Solution of the problem involving real-time constraints, economic realities, and limited data with due consideration for environmental and societal implications.

5413 Instrumentation in Biological Process Control System. Prerequisite: 3023 or equivalent. Analysis of transducers for on-line measurement and 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.

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5501 Seminar. Discussion of current literature with special emphasis on research and experimental techniques.

5623 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 by the student's advisory committee. Independent research and doctoral dissertation under the cognizance of a graduate faculty member in the student's field of specialization.

6313 Stochastic Methods in Hydrology. Prerequisites: 4313 or GIVEN 5843 and STAT 4053 or equivalent. Stochastic and statistical hydrologic analyses of surface water and groundwater systems. Analysis of urban and rural drainage and detention systems. Same as GIVEN 6843.

6323 Advanced Irrigation Engineering. Prerequisite: 3323 or equivalent. Hydraulic design and operation of surface irrigation systems. Management of water and energy in irrigated agriculture.

6333 Hydraulic Flumes. 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. Theory of similitude and its use in planning, conducting and analyzing experiments in engineering and biological sciences.

6520 Problems in Soil and Water Engineering. 2-6 credits, maximum 6. Prerequisite: consent of instructor. Literature review and analytical studies of selected farm field and irrigation problems. Written report required.

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 interfacial diffusion in biological materials. Transport phenomena at interfaces, thermal and cryogenic processes, drying, packed and fluidized bed systems, thermal and moisture control processing affecting quality of food products. Written report required.

6610 Advanced Research and Study. 1-10 credits, maximum 20. 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.

2003 (N)Agroecosystems: A Basis for Life. A study of natural plant and animal processes, for the non-agriculture major. Issues such as factory farming, animal welfare, forest clear cutting, water quality and global warming, as the basis for applying the understanding of the principles.

2112 Microcomputer Techniques in Agriculture I. Lab 2. Operating systems and capabilities of microcomputers for agricultural applications. Simple programming, data analysis, graphical display, spreadsheet, word processing.

3010 Internships in Agriculture. 1-3 credits, maximum 12. Supervised internships with business, industry or governmental agencies including cooperating veterinarians. Graded on pass-fail basis.
AGRONOMY (AGRON)

1213 Crop Production. Soils and cropping practices necessary for production of major agronomic crops. 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 (N) Crop Production Laboratory. Lab 2. Prerequisite: 1213. Hands-on experiences with crop plants. Identification of crops in seed, seedling, mature stages; crop morphology, seed quality, grain grading, growth stages of crops.

2041 Agronomic Orientation. Prerequisite: sophomore standing 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,N) Fundamentals of Soil Science. Lab 2. Prerequisite: CHEM 1215. Primal physical, chemical and biological 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 herbicide application, and application equipment, handling and proper use of herbicides.

3112 Principles of Weed Control. Prerequisite: 1213. 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. Prerequisite: 1213, 2124, and MATH 1213. Pasture systems, livestock management and forage crop production 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 distributions and modern classification of soils. Soil genesis and classification a prerequisite to sound land use planning and land management.

3554 Plant Genetics. Lab 2. Prerequisites: BISC 1304. Basic principles of heredity, interrelationship between classical genetics and molecular genetics emphasized. Mendelian genetics, cytogenetics, mutations, gene regulation and genetic engineering.

3781 Market Grain Technology. Lab 2. Prerequisite: 1213. Quality characteristics of grain for commercial use; identification of different market classes of grain, quality factors, and admixtures affecting the commercial grade; practice in grading grain using the federal grain standards.

3792 Seed Technology. Lab 6. Prerequisite: 1214. Techniques, factors and practices in determining seed purity and germination, methods of seed testing; laws and regulations governing the production, processing, handling and marketing of seed.

3893 Soil Chemistry. Prerequisite: 2124. The chemical and mineralogical properties of soils, weathering and synthesis of minerals in soils, cation exchange and plant nutrition, mechanisms of ion uptake by plants and the role of the soil-borne elements in plant nutrition.
5413* Principles and Methods of Plant Breeding. Prerequisites: 1124 and 2123. Development of domesticated plants and animals; techniques in cell biology and molecular genetics to study and manipulate crop plants. Emphasis on genetic systems which influence productivity and end-product utilization. Integration of biotechnology into plant breeding programs.

5443* Advanced Genetics. Prerequisites: 3545 or equivalent; BIOCH 3453 or 3653. Concepts of eukaryotic genetics with emphasis on classical, molecular and quantitative genetics.

5452* Cytogenetics. Prerequisite: 5443 or concurrent enrollment in BOT 5322. Behavior of chromosomes, cellular organelles and cytoplasm in relation to genetic behavior.

5583* Soil Physics. Prerequisites: MATH 2265 or 2365, PHYSC 1214. Fluid flow through saturated and unsaturated soils; temperature change and heat flow in soil; soil strength and deformation as it applies to plant response.

5613 Methods of Soil, Plant and Water Analyses. Lab 3. Prerequisites: CHEM 2113 and 2122, or 3324. Theory and techniques of current methods of chemical analyses of soils, plant materials and waters. Instrumentation, elemental analyses, and chemical characterization of soils.

5703* Evapotranspiration. Prerequisites: knowledge of calculus and basic physics. Evaporative demands by radiant and advective energy; transport by wind and turbulent mixing. Water movement from soil through plant to air to region. Water budget in bare and vegetated fields including phreatophytes and in regions. Methods of water budget and energy budget measurement and instrumentation.

5760* Special Topics in Range Science. 2-4 credits, maximum 4. Prerequisite: consent of instructor. Selected topics in range research methods, biophysics, grazing management, and range analysis.

5813* Soil-Plant Relationships. Prerequisite: 4234 or equivalent. Essential nutrient reactions in soil theories, concepts, and approximations used to describe the relationship between soil nutrient supply and plant responses that minimize the potential for groundwater pollution.

5863* Management of Agricultural Research Systems. Organization, management and budgeting agricultural research systems with emphasis on developing countries. Analysis of research and training priorities, budgeting, staffing and management of projects.

5954 Range Vegetation Management. Lab 3. Prerequisites: 3914, AG 2112. Methods of improving or maintaining range condition and production. Grazing management; chemical, mechanical and burning treatments; and physical developments. Field trips and reports in laboratory. No credit for students with credit in 4954.

5973* Range and Ranch Planning. Lab 3. Prerequisites: 4954, ANSI 3612. 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. No credit for students with credit in 4973.

5980 Soil Physical Analyses. Lab 1 or 2. 1-2 credits, maximum 2. Prerequisite: 4683. Principles and techniques.

6000* Doctoral Thesis. 1-6 credits, maximum 20. Independent research to be conducted and reported with the supervision of a major professor as partial requirement for the Ph.D. degree.

6010 Advanced Topics and Conference in Agronomy. 1-6 credits, maximum 12. Prerequisite: M.S. degree. Supervised study of advanced topics in areas of agronomic interest. A reading and conference course designed to acquaint the advanced student with fields not covered in other courses in agronomy.

6222* Soil Physical Chemistry. Prerequisite: CHEM 3563 or consent of instructor. Thermodynamics of soil solutions, kinetics, surface chemistry of solid phases important in soil or aquatic systems, techniques in X-ray diffraction and electron microscopy, and examples in geochemical equilibrium modeling.

6263* Biological Evolution. Prerequisite: 3545 or equivalent. Development of evolutionary theory by means of principles of population genetics, absorption of organic and inorganic chemicals from the environment and soil engineering applications.

6463 Quantitative Genetics. Prerequisites: 5413, ANSI 5303, STAT 5023, or consent of instructor. Advanced study in the statistical and experimental analysis of quantitative inheritance pertinent to plant improvement. Gene effects on plant characteristics including effects on genetic mean and variances, genetic interpretation of covariance of relatives produced by outcrossing and self-fertilization, estimation of genetic effects from various generation means, prediction of selection gain in outcrossed and self-fled progeny.

6472 Strategies in Plant Breeding. Prerequisites: 5000-level plant breeding course or consent of instructor. Examination of strategies and philosophies in plant breeding to include consideration of plant genetics resources specific vs. wide adaptation, novel breeding systems, deployment of pest resistant genes, computer programs, test locations, breeding for tolerance to climatic stress, and yield vs. quality.

6683* Advanced Soil Physics. Prerequisite: 5583, MATH 4013. Movement of water in soils.

ANIMAL SCIENCE (ANSI)

1124 Introduction to the Animal Sciences. Lab 2. Species adaptability, product standards and requirements, areas and types of production, processing and distribution of products, includes meat animals, dairy and poultry.

1133 Fundamentals of Food Science. Food industry from producer to consumer and the current U.S. and world food situations.


2302 Dairy Production. Lab 2. Prerequisites: 1124 and 2123. Behavior of cattle in relation to composition of milk produced: requirements of replacement animals; herd health problems peculiar to stresses of production; milking management and mammary health; and dairy breeding programs related to herd management.

2301 Beef Production. Lab 2. Prerequisites: 1124 and 2123. Modern production and management practices for beef cattle operations. No credit for animal science students with credit in 4612, 4621, 4631 or 4641.

2302 Shear Production. Lab 2. Prerequisites: 1124 and 2123. Modern production and management practices for sheep operations. No credit for animal science students with credit in 4542.

2331 Poultry Science. Lab 2. Prerequisites: 1124 and 2123 or 3543. The relationship of the biological concepts and functions of poultry to management practices, incubation procedures, and economic factors utilized by poultrymen in the commercial production of table and hatching eggs, broilers, turkeys and other poultry meat.

2343 Swine Production. Lab 2. Prerequisites: 1124 and 2123. Modern production and management practices for swine operations. No credit for animal science students with credit in 4843.

2353 Meat Technology. Lab 3. Prerequisite: organic chemistry. The basic characteristics of meat and meat products as they relate to quality, product identification, economy, nutritive value, preservation and utilization. No credit for students with credit in ANSI 2253 or 3333.

3010 Undergraduate Seminar. Lab 2. Prerequisites: 60 credit hours and animal science major status. An in-depth consideration of the various areas of specialization in the field of animal science and their associated career opportunities and obligations.

3111* Quality Control. Lab 2. Prerequisites: organic chemistry and BIOCH 1502 or equivalent. Application of the principles of quality control in food processing operations to maintain the desired level of quality.

3182 Meat Grading and Selection. Lab 4. Prerequisite: 2253. Classifying and grading carcasses and wholesale cuts of beef, pork and lamb; factors influencing quality and value.

3211 Animal and Product Evaluation. 1-2 credits, maximum 4. Prerequisite: consent of instructor. Advanced instruction in evaluating slaughter and breeding animals, and grading and evaluating meat, poultry and dairy products.

3223 Food Plant Systems. Lab 2. Prerequisite: MATH 1513. Food plant design and the application of machines to food processing, packaging and storage.


3301 Food Sanitation Laboratory. Lab 2. Prerequisites: 3302 or concurrent enrollment, and BISC 1502. Exercises to illustrate qualitative or quantitative methods for monitoring foods, food ingredients or processing procedures and equipment for proper attainment of sanitation.

3302 Food Sanitation. Prerequisite: organic chemistry. Principles of sanitation in food processing, distribution, preparation and service. Emphasis on control of food spoilage and food-borne illnesses.

3333 Meat Science. Lab 3. Prerequisites: 2253, CHEM 1215 or equivalent. Anatomical and biochemical and physiological characteristics of meat animals studied. The application of scientific principles to the processing and economical utilization of meat animals, as well as in the manufacture of meat products, emphasized in the laboratory.

3373 Food Chemistry. Lab 2. Prerequisites: BIOCH 3543, CHEM 2344. Basic composition, structure and properties of foods and the chemical changes or interactions that occur during processing and handling.
3422 Horse Management and Production. Nutrition, feeding, reproduction and physiological conditioning of horses. Current management concepts as they apply to the health and well being of horses.

3423 (N)Animal Genetics. Prerequisite: BISC 1303. The basic principles of heredity including: kinds of gene action, random and non-random segregation, independent assortment, physical and chemical basis of heredity, mutations, sex linkage, chromosome mapping, multiple alleles and chromosomal abnormalities. Also a brief introduction to quantitative inheritance and population genetics.

3433 Animal Breeding. Lab 2. Prerequisite: 3423. The application of genetic principles to livestock improvement; study of the genetic basis of selection and systems of mating; and the development of breeding programs based on principles of population genetics.

3443 Animal Reproduction. Lab 2. Prerequisite: PHSI 3034 or equivalent. Physiological processes of reproduction in farm animals; gonadal function, endocrine relationships, fertility and factors affecting reproduction efficiency. Emphasis on principles of artificial insemination in the laboratory.

3493* Marketing and Utilization of Milk. Lab 2. Prerequisites: 1152 and AGEX 1301. Functional anatomy and physiology of milk production and utilization of milk pricing, quality controls, procurement, processing and utilization, product distribution and factors affecting consumption.

3543 (N)Principles of Animal Nutrition. Lab 2. Prerequisite: CHEM 1215 or equivalent. Basic principles of animal nutrition including digestion, absorption and metabolism of the various food nutrients; characteristics of the nutrients; measure of body needs; ration formulation.

3603* Processing Dairy Foods. Lab 3. Prerequisites: BISC 1502 and organic chemistry. Theory and practice in formulation and processing: butter and margarine, cottage cheese, cream, cheese, evaporated and sweetened condensed milk; ice cream; ice milk and other frozen desserts.

3612* Range and Pasture Utilization. Lab 2. Prerequisite: AGRON 2974 or 3213. Integration of livestock production with range and pasture management practices.

3653 Applied Animal Nutrition. Lab 2. Prerequisite: 3543. Composition, characteristics and nutritive value of feeds and ration additives; qualitative and quantitative nutrient requirements of each of the classes of livestock; formulation of rations for each of the classes of livestock.

3763 Analysis of Food Products. Lab 2. Prerequisite: organic chemistry. Application of quantitative chemical and physical methods of analysis to the examination of foods.

3903 (!)Agricultural Animals of the World. The production and utilization of agricultural animals by human societies.

4333 Processed Meat. Lab 4. Prerequisite: 3333 or 4033. Meat and meat product composition. Techniques in the molding and forming of meat; sausage formulation; curing; quality control; and cost analysis.

4343 Avian Nutrition. Prerequisite: 3543. Nutritive requirements, feed ingredients, ration formulation and feeding practices for various classes of domestic fowl.

4423 Horse Science. Lab 2. Prerequisites: 3433, 3443 and 3653. Current concepts and production principles related to the horse industry including nutrition, reproduction, health, functional anatomy and implications, social behavior, and applying principles of psychology in horse management and training.

4442 Advanced Cattle Reproductive Management. Lab 2. Prerequisite: 3443. Advanced concepts in cattle reproductive management with emphasis on artificial insemination techniques in cattle.

4542* Sheep Science. Lab 2. Prerequisites: 3433, 3443 and 3653. Breeding, feeding, management and marketing of commercial and purebred sheep.
ANTHROPOLOGY (ANTH)

3353 (S) General Anthropology. Anthropology, emphasizing the study of human physical evolution (physical anthropology) and cultural evolution (archaeology).

3353 (L) Cultural Anthropology. Introduction to culture, various subdisciplines of cultural anthropology, anthropological concepts and capsule ethnographies of various subdisciplines of cultural anthropology, (H,I,S) Cultural Anthropology.

3823 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 and systems and emergence of extensive and complex political units.

4643* Women: A Cross-cultural Perspective. Examines roles of women in different types of societies (hunting and gathering, horticultural, pastoral, and agricultural), Social, familial, economic, and legal status of women in American society. Same course as SOC 4643.

4883 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 adaptation processes.

4883 Comparative Cultures. Compares environments, economies, 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 significant 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 (S) Leadership Concepts. Prerequisite: 12 hours completed course work. Increases undergraduate student competence through the study of leadership concepts. Stresses communications, decision-making, leadership styles and theories and group dynamics. Attempts integration of theoretical concept with reality of application within the university community.

3092 Counseling and Guidance for Dormitory Personnel. Principles and practices involved in counseling and supervising students.
5163* Counseling Techniques for Teachers of Gifted and Talented Students. Prerequisite: 5063 and admission to the graduate program in applied behavioral studies. Techniques for dealing with the conflicts experienced by gifted and talented students. Strategies for consulting with teachers, peers, and parents regarding optimal development of gifts. Peer counseling techniques, dealing with self-concept, social and emotional concerns, problem solving and decision making, referral procedures and self analysis for teachers related to learning and teaching philosophy and style.

5173 Gerontological Counseling. Prerequisites: 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. Historical, legal and ethical principles 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 sociocultural implications of physical disability and illness. Dynamics of adjusting to disability 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: 5063. Development of curriculum content for horizontal and vertical enrichment and acceleration. Commercial and teacher-prepared materials in imagination; imagery; analogy; metaphor; inductive, deductive and abductive thinking; science; psychology; logic systems; problem solving; concept learning; creativity; creative dramatics, etc. Conceptual approaches to the use of the preexisting in various interest-based and non-interest-based formats.

5373 Educational Measurements. Appropriate applications of tests in the schools. Development of teacher-made tests, selection of standardized tests, interpretation of test results, understanding of the statistics reported in testing literature and 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: 5523 or 5553, or SPATH 3202. Utilization of occupational information about jobs and sociological 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 interventions 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 the psychological knowledge with experimental learning. Psycho-social factors, life styles, etc. of various cultural and ethnic groups and their influence on the helping relationship.

5520 Practicum 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 for the preparation of students in the areas of their specialization.

5512 Secondary School Counseling and Development. Cooperation of the school counselor, teachers, principals, and parents emphasized in organizing, developing, implementing and evaluating counseling and development program in secondary schools.

5520* Individual Appraisal. 3 credits, maximum 6. Methods of developing a framework for understanding individuals as well as the factors and qualities that are different, 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 psychology.

5543 Career Development Theories. Historical and contemporary viewpoints advanced by Ginzberg, Super, Holland, Roe, etc. Counselors are assisted in developing the 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 education, economics, prejudice, religion, as well as national activities that are influential in establishing programs for the exceptional.

5572 Elementary School Counseling and Development. Collaboration of the school counselor, teachers, principals, and parents emphasized in organizing, developing, implementing, and evaluating a counseling and development program in elementary schools.

5580 Group Process. Lab 2. Group dynamics, theory and techniques applicable to working with people of all ages in various school and non-school settings. Group member competencies are stressed during the laboratory period.

5590 Counseling Practicum. 3-12 credits, maximum 12. Prerequisites: 5523, 5553, 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. 5623. Methods of preparing teachers in prescriptive techniques and individualized instruction. Procedures dealing with students who have specific learning problems; teaching in modified materials; setting up learning centers or a resource room; pupil motivation; cultural differences, and effective communication with other teachers, parents and administrators.

5613 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 12. 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: survival and special education. Problems that students experience during their preschool, school and adult years; historical and contemporary perspectives; the cultural, environmental and psychological contributions to learning style differences; and issues related to individualized educational planning and instruction. Problems of students with hearing and learning disabilities.

5633* Behavior Characteristics of Exceptional Individuals. Individual differences and problems that exceptional individuals experience. Educational programming 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 the unique activities and interprofessional collaboration with counseling in parents of exceptional children.

5653 Play Therapy in Special Education. Theories and practical applications of play therapy. The application and extension 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 their concomitant applications in the learning environment. Blocks to creative thinking, imagination, 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 supervisor. Supervised individual and group experience for graduate students in counseling.

5673 Developmental Language for the Exceptional Individual. Prerequisites: 3202 or 5663; and SPATH 3213. Normal language development and variations from 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.

5713* Transpersonal Human Development. Human development in terms of individual consciousness, focusing on the implications of such extraordinary states of consciousness 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 Workshop. 1-8 credits, maximum 15. Professional workshops of various topics and lengths. Each workshop designed to focus on the needs of members concerned with education, helping professions, and behavioral studies.

5732* Seminar in Education. Prerequisite: consent of instructor. Preparation of seminar study.

5733 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 parents in working with exceptional individuals. Includes commercial and teacher-student-made materials.
5763* Teaching Methods and Techniques for the Gifted and Talented. Prerequisite: 5363. Subject and skill-related learning facilitation that is process-oriented and student-centered. The role of the teacher as facilitator, counselor and non-directive change agent. Individualized educational plans, involving independent study, tutorial correspondence, clustering, mentors, learning centers, resource centers.

5783* Psycho-educational Testing of Exceptional Individuals. Prerequisite: consent of instructor. Intensive practice in the selection, administration and interpretation of individual tests, appropriate for exceptional individuals.

5843 Characteristics and Identification of the Emotionally Disturbed Learner. Prerequisites: 4513 and PSYCH 3443. 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 and education of mentally retarded children, adolescents, and adults.

5863* Developing Programs for the Gifted and Talented. Prerequisites: 5063 and 5563. Programs based on various philosophies and structural concepts of gifted and talented education, e.g., mainstreaming, self-contained pullouts, magnet schools, timetable blocking, acceleration and enrichment. Programs designed for general 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: 5623. Instructional processes and resources for working with the emotionally disturbed/behavior-disordered learner. A wide range of theoretical approaches explored.

5883* Behavior Management and Affective Education. Prerequisite: 4753. The utilization of various approaches 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, meditation.

5953 Elementary Statistical Methods in Education. Elementary statistical methods needed by consumers of cumulative and anecdotal records and inferential statistics. No credit for students with credit in 5015.

5962* Developing Support Resources for Gifted and Talented Programs. Prerequisite: 5863. Development, management, and evaluation of volunteer programs in intra- and extra-class settings. Program types include parent-aid, volunteer-aid, mentors, tutors, group spon- sors. Developing community interest, finding external resources, external funding and resource information sources.

5983 Intermediate Research Techniques in Education. Prerequisites: 5013 and 5593 or 5015. Principles of experimental design in education and behavioral sciences. Emphasis on interpretation of variance designs in conducting experiments and related data analysis strategies.

5993* Cognition and Behavior Characteristics of the Gifted and Talented. Prerequisites: 5373 and 5863. Cognitive, affective, and behavioral characteristics of the gifted and talented. Selection of tests and interest inventories. Selection and/or development of nomination/recom- mendation 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: 5983. Applications of multiple regression as a general data analysis strategy for experimental and non-experimental research in behavioral sciences.

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 case law for the practice of counseling psychology in case studies.

6083* Principles of Counseling Psychology. Prerequisite: 5553 of equivalent. Development, theoretical foundations and applications of therapeutic models of counseling and psychology.

6110 Seminar in School Psychology. 1-3 credits, maximum 6. Prerequisite: concurrent enrollment in 6210. An 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: enrollment in school psychology program. Supervised field experience in the duties of a school psychologist consisting of one semester participa- tion under the direction of a certified school psychologist or other qualified field personnel approved by the super- vising faculty member.

6213* Higher Education Student Personnel Services. Prerequisite: 6173. Higher education student personnel services such as: admissions, orientation, student activities, financial aids, 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 for students with advanced graduate standing in all aspects of student housing, student activities, financial aid, student personnel advisement, student personnel administration, student union, group facilitation and other appropriate work situations.

6310* Advanced Practicum and Supervision. 1-12 credits, maximum 12. Prerequisites: 5593 and master's degree. For prospective counseling psychologists, counselor educators and supervisors, and practicing counselors. Supervised assistance in development of counseling, counseling and supervising competencies.

6373* Program Evaluation. Prerequisite: 5013 or 5015. Concepts, purposes and techniques of evaluatin educational programs. Evaluation design, information collection, analysis, reporting and uses of results 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. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Supervision and guidance of teaching and service in educa- tional psychology. May be repeated for credit when work assignment varies. Required of all teaching assistants in educational psychology during the first semester of each new teaching assignment. Includes cooperative plann- ing and evaluation.

6533 Human Motivation. A theoretically-oriented approach to the concept of motivation; essential prerequisites to human behavior and applications to the solution of real and hypothetical problems.

6583* Advanced Practice in Marital and Family Treatment. Prerequisites: 6523, concurrent enrollment in counselor- or clinical practicum or consent of instructor. Advanced methods in assessment diagnosis and treat- ment of marital and family problems. Skill development, professionalism, ethics and case management. Dynamics of co-therapy and co-treatment. Case consultation format. Same as PSYCH 6553.

6650* Advanced Internship in Counseling. 1-3 credits, maximum 6. Prerequisite: admission to the doctoral program in counseling and student personnel or applied behavioral studies emphasizing counseling and develop- ment, and consent of instructor. Designed to facilitate counseling effectiveness and to set the stage for a pro- ductive life of professional practice.

6663* Current Trends and Issues in Special Education. Current research and literature regarding the education of exceptional children.

6665* 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.

6858* Internship In Education. 1-8 credits, maximum 8. Lab 3-24. Prerequisites: admission to advanced graduate program and consent of department head. Directed field experience off-campus experiences designed to relate ideas and con- cepts to problems encountered in the management of the school program.

ARCHITECTURE (ARCH)


2003 (H) Architecture and Society. Design, planning and building considered in their social and aesthetic contexts.

2100 Architectural Studies. 2-4 credits, maximum 4. Lab 6-12. Beginning studies in graphics and design in architecture.


2116 Architectural Design Studio II. Lab. 16. Prerequisite: grade of "C" or better in 1216. Problems in architectural design.

2183 (H) History and Theory of Architecture I. Prerequisite: 2003. History and theory of the Pre-Enlightenment era of architecture in the Western world.

2216 Architectural Design Studio III. Lab. Prerequisite: grade of "C" or better in 2116. Problems in architectural design.

2234 Environmental Control: Thermal Systems and Life Safety. Lab 2. A survey of the fundamentals of thermal comfort, energy concerns and mechanical systems for buildings as well as the basic principles of life safety.

2263 Building Systems and Materials. Prerequisite: grade of "C" or better in 2116. Architectural, structural, envi- ronmental 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. Lab. 16. Prerequisite: grade of "C" or better in 2216 and admission to third year. Problems in architectural design.
3123 Structures: Elementary Analysis. Lab 2. Prerequisite: grade of "C" or better in 2114. Structural theory for applications in architecture.

3133 Environmental Control: Acoustics and Lighting. Prerequisite: MATH 1513 or 1715. A survey of architectural acoustics, electrical and lighting systems for buildings.

3246 Structures: Elementary Steel and Timbers. Prerequisite: grade of "C" or better in 3123. Analysis and design of steel and timber structures used in architecture.


3283 (H) History and Theory of Architecture II. Prerequisite: 2003. Specific course content varies from year to year; exploration of some aspect of Renaissance and Baroque architecture in the Western world.

4083 English Renaissance and Early American Architecture. Prerequisite: 2003. Renaissance Britain from 1558 to 1642, surveying Elizabethan, Jacobean and Palladian and English Baroque architecture demonstrating its importance to the development of Early American architecture.

4117 Architectural Design Studio V. Lab 20. Prerequisite: grade of "C" or better in 3117. Problems in architectural design.

4123 Structures: Elementary Concrete. Lab 2. Prerequisite: grade of "C" or better in 3123. Analysis and design applications in architectural problems using concrete structures.

4143* Structures: Foundations for Buildings. Prerequisite: 4123 or consent of instructor. Interaction of frames and supports for structures used in architecture. Subsurface conditions and design of foundation systems and retaining walls for buildings.


4193 Marketing Professional Services. Prerequisite: 3117. Business development aspects of design firm management, including: marketing plan development; marketing organization; strategies and tools; selling techniques and contract negotiating.

4217 Architectural Design Studio VI. Lab 20. Prerequisite: grade of "C" or better in 4117. Problems in architectural design.

4244 Structures: Intermediate Steel. Lab 3. Prerequisite: grade of "C" or better in 3246. Design and analysis of multi-story buildings, trusses, arches and other architectural structural components.

4273 (H) History and Theory of Architecture IV. Prerequisite: 2003. Specific course content varies from year to year; exploration of some aspect of 19th and 20th century architecture in the Western world.

4370 Field Study in Europe I. 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. Theory, research or design 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 1950 to 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 state-of-the-art advances.

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, student 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 5123. Mathematical formulation of architectural structural behavior. Matrix applications, finite element, finite differences, stability considerations and three-dimensional structuring modeling.

5223 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.

5323 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.

6000 Special Problems. 1-15 credits, maximum 15. Lab 3-18. Prerequisite: consent of instructor and head of School. Theory, research or design in specific areas of study in the field of architecture and its related disciplines. Plan of study determined jointly by student and graduate faculty.

6073 Survey of Non-Western Architecture. Prerequisite: graduate standing or consent of instructor. Architecture in the non-Western and pre-Columbian World.

6083 Survey of Contemporary Architecture. Prerequisite: graduate standing or consent of instructor. American architecture beginning in the 16th Century through the 20th Century.

6100 Special Topics. 3-6 credits, maximum 15. Subjects selected by the graduate faculty in architecture to cover advances in the state-of-the-art.

6113* Professional Project Research. Prerequisite: 5217. Data gathering, analysis and program formulation related to professional project.

6117 Architectural Design Studio VIII. Lab 20. Prerequisite: 5217. Problems in architectural design.

6123 Structures: Advanced Steel. Prerequisite: grade of "C" or better in 4244. Plastic analysis and design of structural steel frames utilizing load and resistance factor design.

6143 Computer Applications in Architecture. Lab 3. Prerequisite: consent of instructor. State of the art applications of computers to the practice of architecture and architectural engineering.

6183 Architecture Seminar I. Seminar for graduate students only. Must be taken concurrently with 6117.

6193 Financial Management for Architects and Engineers. Prerequisite: 3117. Financial aspects of design firm management, including: fundamentals of finance; profit planning and control; cash management and analysis of financial statements.

6206 Creative Component in Architectural Engineering. Lab 18. A design project based on a program previously developed by the student, to include a written report and supporting documents when appropriate. Must be approved by the project adviser and completed in the final semester of the graduate program.

6207 Creative Component in Architecture. Lab 20. Prerequisite: 6117. A design project based on a program previously developed by the student to include a written report and supportive documents when appropriate. Must be approved by the project adviser and completed in the final semester of the graduate program.

6214 Graduate Design Studio. Lab 12. Prerequisite: 6117. Independent projects or competitions. May be combined with 6208 with approval of adviser.

6223 Structures: Advanced Concrete. Prerequisite: grade of "C" or better in 5144. Design of prestressed concrete structures, including pre- and post-tensioning.

6224 Structures: Advanced Analysis. Prerequisite: grade of "C" or better in 5223. Analysis techniques for architectural structures including stability, space frames, computer applications, guyed towers and project research.

6283 Architecture Seminar II. Seminar for graduate students only. Architectural criticism.


**ART (ART)**

1103 Drawing I. Lab 6. A freehand drawing experience designed to build basic skills and awareness of visual relationships. A sequence of problems dealing with composition, shape, volume, value, line, gesture, texture and perspective. A variety of media explored.

1113 Drawing II. Lab 6. Prerequisite: 1103. Objective and subjective approaches to visual problem solving in a variety of media.

1180 Introduction to Art. An introduction to the analysis and interpretation of visual arts. Visual, emotional and intellectual aspects of art in painting, sculpture, printmaking and architecture.

Three-dimensional Design. Lab 6. Prerequisites: 1103 and 1203. Exploration of three-dimensional form and space stressing organization of design elements, development of concepts and manipulation of materials. Investigation of linear space, modular ordering, mass/volume and color through projects of a conceptual and materialized nature.

Design II. Lab 6. Prerequisites: 1103, 1203. Color theories and their application to visual problem solving; distinctions between light and between additive and subtractive color mixing. The nature and properties of color, its expressive qualities, symbolic potential, and psychological impact.

Advanced Drawing. 3 credits, maximum 9. Lab 6. Prerequisite: 2103. Investigation of drawing stressing thematic development, abstract ideas, and individual imagery.

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.

Watercolor Painting. Lab 6. Prerequisites: 1103, 1113, 1203, 2203, 2213, 2603, 2613 or permission of instructor. The development of skills in watercolor painting stressing form and content, visual perception and individual expression. Structured assignments in color mixing, wet-on-dry techniques, wet-in-wet techniques, brush handling, paper supports and surface manipulation.


Jewelry and Metals. Lab 6. Prerequisites: 1103, 1113, 1203, 2203, 2213, 2603, 2613 or consent of instructor. Fabrication and forming techniques for non-ferrous metals. Cold joinery, silver soldering, surface treatment and elementary stone setting. Applications toward either wearable or small scale sculptural form.

Illustration. Lab 6. Prerequisite: 3413. Exploration of conceptual to technical picture-making utilizing a wide range of media and techniques. Emphasis on the proper use of reference material to complete sample problems in editorial, advertising, and technical illustration.

Lettering and Typography. Lab 6. Prerequisites: 1103, 1113, 1123, 2033, 2203, 2603, 2613. The study of symbolic communication including the practice of calligraphy, reproduction lettering, typography and experimental typographic design. Emphasis on innovative typography and the use of pictorial symbols as forms of communication.

Graphic Design. Lab 6. Prerequisite: 3413. Aspects of visual communication: ideation, production skills, selection and use of materials and reproduction processes. Sequential course work includes grid and proportional systems, information organization, layout, comprehensives, mock-ups, and mechanical preparation.

Applied Graphic Design. Lab 6. Prerequisite: 3423. Design problems with special attention to signage, exhibition design, packaging, display, and point of purchase. Use of model-building tools and study of structure and form to introduce the student to problem-solving and finishing techniques. Development of concepts into models.

Ceramics. Lab 6. Prerequisites: 1103, 1113, 1203, 2203, 2213, 2603, 2613, or consent of instructor. Methods of clay preparation, hand building, forming and firing techniques, methods of decoration and glazing, forming and kiln construction. Involvement with ceramic materials and processes.

History of Classical Art. Stylistic, philosophical and formal qualities of art in the Classical world. The creation of the Greek ideal and its dissemination in the Roman world through architecture, sculpture, and painting.

Medieval Art Survey. A survey of European art and architecture from the fall of Rome to the end of the Gothic period, approximately 400-1400. Includes a study of the late Middle Ages as emerging from the blending of earlier traditions: classic, Byzantine, barbaric, Christian, and Moslem.

History of Renaissance Art. A survey of Italian painting, sculpture, and architecture from the thirteenth through the sixteenth century. Includes painting in northern Renaissance Europe, Jan van Eyck to Pieter Bruegel.

History of Baroque Art. Painting, sculpture, and architecture in Counter-reformation Italy, Spain, and Flanders. The second half of the course focuses on seventeenth-century Protestant Holland, analyzing the problems of the development of their own native art in painting including portraits, landscape, still life, and genre.

History of 19th Century Art. Art of 19th century Europe contrasting academic, realistic, and romantic developments, beginning with the French Revolution and ending in 1900.

History of American Art. Prerequisite: 2603 or 2613. Emphasis on development of American arts from Colonial period to present. Major styles, ideas and uses of materials in architecture, painting, sculpture and design.


Printmaking: Intaglio. Lab 6. Prerequisite: 1103, 1113, 1203, 2203, 2213, 2603, 2613 or permission of instructor. The development of concepts and images through the intaglio process. Development of concepts and images through traditional and contemporary approaches to the intaglio process.

Printmaking: Lithography. 3 credits, maximum 9. 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 stones and metal plates. Development of concepts and images through the medium of lithography.

Oil Painting Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3123. Oil painting with emphasis on personal development of visual ideas and technique.

Watercolor Studio. 3 credits, maximum 6. Lab 6. Prerequisite: 3133. Structured assignments with exploration of individual concepts, ideas and imagery to reinforce growth of technical skills and personal painting style in watercolor.

Sculpture Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3333. A broad-based course which allows students to pursue individual interests using a variety of materials and processes. Emphasis on further development of concepts, skills and techniques.

Jewelry and Metals Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3343 or 4343. Metalworking processes including casting, rubber modeling, and advanced stone setting. Consideration of non-metal media. Emphasis on development of materials and ideas through conceptual problems.


Graphic Design Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3423. Design problems suited to the professional portfolio. Discussion of practical issues including career options, resume and portfolio preparation, and interviewing techniques. Investigation of historic precedent in graphic design.

Illustration Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3420. Developing and finishing illustrations for advertising, editorial, reporitorial, and technical use. Emphasis on visual control of a two-dimensional composition to relate the intent of the client/artist. Line, black and white, limited and full color. All media.

Ceramics Studio. 3 credits, maximum 9. Lab 6. Prerequisite: 3303. Continued explorations of ceramic arts: glazes, clay bodies, methods of forming, decorating, firing. Continued emphasis on the relation between visual unity and individual expressive concepts as these apply to both utilitarian and conceptual forms.

Art Since 1945. Art and art theory from 1945 to the present. Major trends of abstract expressionism, pop art, minimalism, conceptual art, and intellectual bases of each movement as well as major critical responses.

Survey of African Art. Art products of traditional sub-Saharan African societies as they have evolved in relation to human needs, religion, philosophy, history, geography and anthropology. The contribution of African art to world art and approaches toward esthetic evaluation.

Survey of East Asian Art. Arts of China, Korea and Japan in their historical and cultural settings. Major emphasis on painting, sculpture, and architecture, but other arts including porcelain, furniture and prints.

Special Studies in Art. 1-3 credits, maximum 9. Prerequisites: junior standing and consent of instructor. Courses in new or emerging special subject and current issues. Offered on campus or through extension workshops.

Directed Study. 1-3 credits, maximum 9. Lab 1-6. Prerequisites: junior standing and written permission of department head. Self-designed special topics in studio art or art history. By contract only.

Honors Professor Pr.ect. Prerequisites: departmental invitation, senior standing. Honors program participation. A guided reading and research program ending with an honors thesis or project under the direction of a faculty member. Required for graduation with departmental honors in art.

ARTS AND SCIENCES (AS) 1103 (H,SppD) An Introduction to the Arts: Literature, Music and Painting. Formal design subject to the painting, music and literature. An introduction to the several arts.

Freshman Orientation. Orientation for freshmen. Study techniques, evaluation of one's abilities and the making of proper educational and vocational choices.

Honors Freshman Orientation. Prerequisite: Honors program participation. Orientation for freshmen to Arts & Sciences Honors program, introduction to University academic expectations, techniques for achieving academic success, and substantive introduction to material in selected academic disciplines. No credit for students with credit in A&S 1111.
Astronomy (ASTRO)  

1104  

2023  
(N)General Astronomy. Prerequisite: PHYSC 1214 or equivalent. More rigorous treatment of material in 1104 for majors in physical sciences and other areas.

AVIATION AND SPACE EDUCATION (AVSED)  

1115  
Theory of Flight. A ground school course covering Federal Aviation Regulations, theory of flight, power plant operation, service of aircraft, principles of navigation and meteorology. Fulfills the ground school training needed for a Private Pilot Certificate.

1222  
Flight Training. Lab 4. Meets the flying requirements for a Private Pilot Certificate. Includes all maneuvers and cross-country flying required by the Federal Aviation Administration for the issuance of a Private Pilot Certificate. Requires a minimum of 20 flight hours with an instructor and 15 hours of solo flight. Training conducted at the Stillwater Airport under the direction of Federal Aviation Administration certificated instructors. Special fee required.

2122  
Secondary Flight. Lab 4. Prerequisite: 1222 or Private Pilot Certificate. First of three courses, 2122, 2332, and 3442, which terminate in the issuance of a Commercial Pilot Certificate or benefit the pilot who wants to improve flying skills. Includes maneuvering and cross-country flying. Requires 10 flight hours with an instructor and 30 flight hours solo. Special fee required.

2332  
Intermediate Flight. Lab 4. Prerequisite: 2122. Special flight instruction in night flying, instrument flying, and cross-country flying. Includes training in use of radio navigation and the flight computer. Requires 20 flight hours with an instructor 15 flight hours of solo maneuvers and 20 flight hours of solo cross-country. Special fee is required.

2633  
Air Traffic Control and the National Airspace System. Prerequisite: 1113. In-depth knowledge in the subject of air traffic control and the national airspace system facilities, equipment and associated development. Enroute and terminal control areas, computerization and automation, flight service systems, ground-to-air systems and integrated telecommunications networks.

3223  

3333  
Theor of Instrument Flight. Prerequisite: 1113 or permission of FAA Private Pilot Written Examination. Instrument flight rules, the air traffic system and procedures, and elements of forecasting weather trends.

3334  

3335  
Advanced Aircraft Systems Control. Prerequisites: 1113, 1222, 2122, 3223, or consent of instructor. Study of complex aircraft systems: airframe, jet engines, electrical, avionics, pressurization, fuel and icing. Operations and control of these systems as well as the concept of cockpit resource management. High performance IFR flight, special weather environments, stability augmentation, aircraft monitoring systems, aerodynamics, laser inertial reference systems, electronic flight instrument systems, and advanced aircraft performance.

3441  
Acrobatic Flight Laboratory. Prerequisites: 1113 and 1222. Minimum of ten hours dual flight training. Basic, intermediate and advanced aerobatic flight maneuvers including sequencing and dimensional box spacing. Special fee required.

3442  
Advanced Flight. Lab 4. Prerequisite: 2332. The final phase of flight training in preparation for the Commercial Pilot Certificate. Requires 20 flight hours with an instructor and 10 flight hours of solo on precision maneuvers. Special fee required.

3443  
Introduction to Aviation Law. Prerequisite: 50 credit hours of aviation law. Flight pertinent to federal governing bodies in addition to local and international laws forming the present structure of aviation law. Practices and pitfalls in aviation activities and procedures as a basic legal research capability.

3551  
Multieengine Flight Laboratory. Lab 2. Prerequisite: Private Pilot Certificate. Dual flight training in preparation for the Multiengine Flight Examination. The student will obtain the experience and skill necessary to add an Airplane, Multiengine Land Class Rating to his/her private or commercial pilot certificate. Study of airplane systems, engines, airspeed, performance characteristics. Special fee required.

3552  
5830. Laboratory methods. No credit for students with credit in Biochemical Laboratory Methods. Lab 8. 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.

5930. Advanced Biochemical Techniques. 1-5 credits, maximum 5. Prerequisite: 5753 or concurrent registration, and consent of head of Department. Comprehensive lecture and laboratory course in advanced research techniques covering photometry, chromatography, isotopes, enzymes, macro-molecules and metabolism. Offered 2-5 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.

6030. 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. Prerequisite: one semester of biochemistry, calculus and physical chemistry. Physical principles underlying molecular phenomena of biology and methods for their study. Besides core 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 modeling of enzyme action. Enzymes and their role in metabolism.

6762. Nucleic Acids and Protein Synthesis. Prerequisite: 5753 or 4113. The elucidation of the genetic information by means of protein synthesis. Structures, mechanisms, enzymatic synthesis and modification, reaction sequences, and control emphasized.

6772. Protein Structure. Prerequisite: 5733 or 4113. Protein structure (sequence, conformation, quaternary structure) illustrated by examples of selected proteins.

6782. Membranes and Transport. Prerequisite: 5853 or 4113. Components, organization and biosynthesis of cellular membranes, emphasizing structure-function relationships of plasma membranes. Mechanisms and energy sources of transport of substances across various membranes including plasma membranes and organelles.

6792. Plant Biochemistry. Prerequisite: 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.

6820. Selected Topics In Biochemistry. 1-2 credits, maximum 6. Prerequisite: 5853. Subject matter will vary from year to year; students should inquire at the Department office before enrolling.

BIOLOGICAL SCIENCE (BISC)

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, metabolism of living systems, coordination and behavior. For the nonmajor.

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 methods which have enabled animals to survive and adapt to diverse habitats.

2220. Current Topics In Biology. 2 credits, maximum 8. Prerequisite: 1114 or 1304 or equivalent. Topics of current interest especially designed for nonbiology majors.

2222. (N,SpD)Survey of Human Diseases. Prerequisite: 1114 or 1603 or equivalent. Types of diseases, such as infectious or genetic, and diseases of major organ systems. How diseases are diagnosed and treated; biological processes involved in disease. For the nonbiology major.

2232. (N)Human Reproduction. Prerequisite: 1114 or 1304 or equivalent. Human reproduction is dealt with in terms of anatomy, physiology, genetics, and evolution. Birth control, and teratogenic substances as well as pregnancy and childbirth. For the nonbiology major.

2252. (N)Environment and Society. Prerequisite: 1114 or 1304 or equivalent. The impact of human activities on the natural world and an analysis of the potential of technological and societal changes on the environment. For the nonbiology major.

2262. (N,SpD)Plants and People. Prerequisite: 1114 or 1304 or equivalent. Types of plants, form and function, uses of plants by people, and impact of plants on society. For the nonbiology major.

2272. (N,SpD)Human Origins. Prerequisite: 1114 or 1304 or equivalent. The scientific evidence for the evolution of human morphology, technology, behavior and ecology. For the nonbiology major.

2283. (N,SpD)Microbes and Society. Lab 2. Prerequisite: 1114 or 1304 or equivalent. Characteristics of bacteria and viruses, types and methods of diseases. Types of diseases, such as infectious or genetic, and diseases of major organ systems. How diseases are diagnosed and treated; biological processes involved in disease. For the nonbiology major.

3014. Cell and Molecular Biology. Lab 3. Prerequisites: 1403, or 1603, or equivalent. 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, interaction of organisms with 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.
5000 Research. 1-6 credits, maximum 6. Research for the M.S. degree.
5104* Mycology. Lab 6. Prerequisite: graduate standing. Study of the fungi. Same as PLP 5104.
5110 Problems in Botany. 1-5 credits, maximum 8. Prerequisite: consent of instructor. Special studies in any area of botany.
5213 Botanical Limnology. Lab 3. Prerequisite: BISC 1403. Taxonomy, ecology, and physiology of freshwater algae and vascular aquatic plants, with special reference to their role in overall limnological dynamics. Field trips required.
5223* Vegetation Sampling and Measurement. Lab 3. Prerequisites: 3005 or 3114; 4023 and introductory statistics; or consent of instructor. Theory and application of quantitative sampling of vegetation in terrestrial habitats with emphasis on density, frequency and mass. Local field trips and special project required.
5232* Cytoenzymology Laboratory. Lab 4. Prerequisite: AGRON 3542 or concurrent enrollment. Cytoenzetic research techniques, especially karyotyping; observation and interpretation of cytogenetic phenomena including mitosis, meiosis and chromosomal aberrations.
5263* Plant Physiological Laboratory Techniques. Prerequisite: 3463 or equivalent. Research techniques applicable to plant physiological problems.
5314* Phylogeny and Classification of Flowering Plants. Lab 6. Prerequisite: 3114. Plant taxonomy and the relationships of various groups of vascular plants.
5403* Physiological Action of Herbicides and Plant Growth Regulators. Prerequisites: 3463 and 3460 or equivalent. Research techniques applicable to herbicidal and plant growth regulators in plants and soils.
5423* Physiology of Ion Metabolism. Prerequisite: 3463 or equivalent. Physiology of ion absorption, translocation, metabolism and functions in higher plants.
5533 Advanced Ecology. Lab 3. Prerequisites: 4023 or BISC 3005. Ecological and evolutionary aspects of plant ecology as revealed by recent research. Spring recess field trip required.
5543 Plant Population Ecology. Prerequisites: BISC 3024 and 3034, or equivalents. Variation below the species level in natural plant populations: genetic basis (including quantitative genetics), ecological implications, and microevolutionary outcomes. Emphasis on morphological, biochemical, and life-history variation and their adaptive significance, with some consideration of the larger processes of coevolution, divergence, and speciation.
5753 Physiology of Plant Growth and Development. Prerequisite: 3463 or equivalent. Molecular mechanisms of growth and development, subcellular organization and function, plant hormones, photomorphogenesis, germination and dormancy, senescence and abscission, plant rhythms.
5763 Plant Tissue Culture. Lab 3. Prerequisite: 3463 or BISC 3024. Rhizoids in sterile culture; regeneration from embryos; morphogenesis 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 morphogenesis, embryogenesis, gametogenesis, and 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; photosynthesis, water relations, water and temperature stress, flowering, dormancy and germination.

BUSINESS ADMINISTRATION (BUSAD)
1111 Business Freshman Orientation. Prerequisite: freshman standing only. Required of all first semester freshmen in the College of Business Administration. An orientation to the CBA and OSU; survival skills; and a study of the career opportunities and curriculum in the various business departments. Graded on a pass-fail basis.
2010 Special Topics. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special topics and independent study in business.
3713 International Business. Prerequisites: ECON 2103, FIN 3113, MGMT 3013, MKTG 3213. Development of international business strategy based on the integration of economics, accounting, financial, management and marketing concepts.
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. Prerequisites: junior standing and consent of the instructor and the Dean. Study of an interdisciplinary nature of various important issues and aspects of our business and economic environment. Provides opportunity to integrate knowledge and skills the able student with a strong interest in scholarship.
4113* 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 business core body 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 now face and of problems that they will face given current trends in the external environment.
5003 Computer Applications In Business. Prerequisite: admission to MBA program or consent of MBA director. demonstrated personal computer usage proficiency. Introduction to management information systems, statistical and optimization packages, financial modeling languages and micro-computers. Algorithmic programing in FORTRAN/BASIC/COBAL.
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. Current problems in business education, based upon the interests and needs of the students.

5330
Field Study. 1-6 credits, maximum 6. Prerequisite: consent of department head. Individual investigation 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 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 department head and supervising professor. Supervised reading of off-the-shelf 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. Local needs of society and the probable future direction of the law.

3213
Law of Contracts and Property. General concepts of jurisdiction, judicial systems, substantive law of torts, contracts, and property as they relate to the business environment.

3323
Law 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, payments, agency, sales, and negotiable instruments. Not open to students who have credit in 3213.

4413
Law 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.

4523
Law of Real Property. Prerequisite: 3213 or equivalent. Nature of real property and of the legal transactions relating thereto. Topics may include deeds and conveyancing, landlord-tenant relationships, mortgages, easements, oil and gas interests, types of estates, joint ownership, and legal descriptions.

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 transnational contracts, problems of technology transfer on the international market, anti-trust aspects of international business, and jurisdictional problems in resolving disputes.

5100
Legal Environment of Business. Legal environment within which business must operate. 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 the legal environment having a direct relationship with business operation and decision making.

5210
Business Communication Applications. 1-3 credits, maximum 3. Application of communication techniques to the business setting. Interpersonal communication techniques necessary for the manager in a business organization. Problems and applications within the modern business setting.

BUSINESS PROFESSIONS (BUSPR)

2313
Production Typewriting. Lab 2. Prerequisite: 1100 or equivalent. Continued skill development in correct techniques, speed and accuracy with major emphasis on the application of skill.

2630
Automated Office Applications. 1-3 credits, maximum 3. Lab 4. Prerequisites: 2313 or equivalent and 24 semester credit hours. Application of automated office equipment to work processes in the office. Operation and use of word-processing equipment for text editing, operation of different word-processing systems and other office information systems, and transcription of office communications.

3523
Office Problems in Typewriting. Lab 2. Prerequisite: 2313 or equivalent. Problems in office situations requiring application of typewriting knowledge and skills. Emphasis on quality work at high speeds.

4363
Teaching Bookkeeping and Accounting. Prerequisites: ACCTG 2203, ABSED 3213, CIED 2113, skill in secretarial business subjects, and full admission to Teacher Education. Teaching bookkeeping and accounting including development of objectives; organization, assessment and preparation of instructional resources and materials. Administration and interpretation of assessment techniques; design and use of diagnostic and achievement examinations; interaction patterns and instructional modifications.

4653*
Data Processing Instructional Methods and Procedures. Prerequisite: GENAD 2103 or COMSC 2113. Instructional methods in the teaching of data-processing courses including the development of an understanding of computer hardware and software concepts and terminology. Problems, methods, and techniques in using and teaching concepts about the computer and computer programming languages are included. "Hands-on" programming experience is an integral part of the course. Lab required.

5770*
Current Issues in Vocational Business Programs. 1-3 credits, maximum 6. Prerequisite: graduate standing or consent of instructor. Problems, materials, methods, history and current theory and philosophy of vocational business programs.

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. Study of chemical thermodynamics, rates and 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 ENGSC 3233. Basic rate equations for heat, mass and momentum transfer; 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 CHEM 3013.

3243*

3473
Chemical Engineering Thermodynamics. Lab 3. Prerequisites: ENGSC 2213; concurrent enrollment in CHEM 3115. Application of thermodynamics to chemical process calculations. Behavior of fluids, including estimation of properties by generalized methods. Study of chemical thermodynamics involving heats of reaction, chemical reaction and phase equilibria.
and thesis writing.

**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.

**Chemical Engineering Design II.** Prerequisite: 4124. A continuation of CHENG 4124. Economic analysis of process plants and equipment. Design of chemical processing equipment and chemical plants. Application of computer techniques to chemical engineering design.

**Chemical Processes.** Prerequisite: senior standing. Chemical processes industries are studied from the standpoint of technology, raw materials, products and processing equipment. Thermodynamics and kinetics of industrial processes.

**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.

**Seminar.** Prerequisite: senior standing. Recent developments in chemical engineering and the process industries.

**Fundamentals of Reservoir Engineering.** Prerequisite: MATH 2613 and 3013 or MAF 3015. Properties of porous media, properties and phase behavior of reservoir fluids. Computational schemes, including numerical methods and an optimizing production rates and establishing reserves.

**Petroleum Processes.** Prerequisite: 3473. Analysis of the unit processes of petroleum refining.

**Process Control Laboratory.** 2-5 credits, maximum 5. Lab 4-8. 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 blocks.

**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.

**Special Problems.** 1-5 credits, maximum 5. Lab 3-15. Prerequisites: senior standing. Tentative list: independent work, study of relevant literature and experimental investigation of an assigned problem.

**Masters Thesis.** 1-6 credits, maximum 6. Prerequisite: approval of major professor. Methods used in research and thesis writing.

**Doctoral Thesis.** Prerequisite: approval of major professor. The doctoral candidate is expected to complete 30 semester credit hours in research, including the dissertation. May be repeated for credit if subject matter varies.

**Chemical Engineering Laboratory II.** (L)Prerequisite: 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.

**Advanced Chemical Reaction Engineering.** Prerequisite: 4123. Advanced principles and applications of chemical kinetics in catalysis, heterogeneous systems, non-ideal reactions, polymerization and biological reactions.

**Selected Diffusions! Unit Operations.** Mass transfer in fluids. Diffusion in liquids and gases. Equilibrium stage and transfer unit concepts. Mass transfer concepts of diffusional unit operations such as absorption, adsorption, crystallization, drying, humidification and liquid extraction.

**Biochemical Engineering.** Prerequisite: consent of instructor. Application of fundamental chemical engineering principles to challenges posed by biotechnology. Fermentation technology, biological mass transfer and kinetics, and bioprocessing design and scale-up.

**Introduction to Nuclear Engineering.** 3-4 credits, maximum 6. Principles and application of nuclear energy. The fission reaction, the behavior of neutrons, nuclear reactor theory and nuclear reactors.

**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.


**Biological Failure Analysis.** Prerequisite: ENGSC 3313 or equivalent. Mechanisms that cause materials failure. Instrumentation used for failure analysis. Case history study of representative failures. Laboratory analysis of failed samples.

**Corrosion Engineering.** Prerequisite: ENGSC 3313. Modern theory of corrosion and its applications in preventing or controlling corrosion damage economically and safely in service.


**Chemical Engineering Process Modeling.** 3 credits, maximum 6. Chemical engineering systems and process models. Analytical and numerical methods of solution of resulting equations or systems of equations, with computer methods in a chemical engineering context.

**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.

**Principles of Chemical Engineering Thermodynamics.** Principles of thermodynamics. Properties of fluids and prediction of thermodynamic properties. Phase and chemical equilibrium. Thermodynamics in unit operations.

**Advanced Chemical Process Control.** Prerequisite: 4843 or equivalent. Computer-based process control techniques. Discrete equivalent to the PID analog control. Z-transform analysis of sampled-data control systems. Digital control algorithms for feed, feedback, and multivariable control. Application of advanced concepts to distillation control and other chemical process units.

**Air Pollution Control Engineering.** Causes, effects and control of atmosphere pollution. Same course as CIVEN 5873.

**Petroleum Technology.** Polymerization, catalytic cracking, reforming and other unit processes. Unit operations as applied to petroleum refining. Economics of refining operations.

**Special Problems.** 2-4 credits, maximum 9. Prerequisite: consent of instructor. Independent report topics in chemical engineering involving operations, processes, equipment, experiments, literature search, theory, computational or combinations of these.

**Doctoral Thesis.** 2-15 credits, maximum 30. Prerequisite: approval of major professor. The doctoral candidate is expected to complete 30 semester credit hours to a maximum of 15 semester credit hours in each semester during which laboratory work is in progress. Mathematical, theoretical aspects of fluid dynamics, heat transfer and mass transfer. Boundary layer theory, multiphase flow theory of diffusion and interphase mass transfer. Analyses between heat, mass and momentum transfer.

**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. Analyses between heat, mass and momentum transfer.

**Advanced Chemical Engineering Thermodynamics.** Prerequisite: 5843. Phase equilibrium in multicomponent systems and reactor systems. Properties of fluids and the prediction of properties by statistical methods. Application of thermodynamics to unit operations.

**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 matter varies.

**Chemical Engineering Kinetics.** Prerequisite: 6223. Kinetics of chemical reaction. Reaction rates in homogeneous systems. Design of batch and fluid reactors. Catalysis and the design of gas-solid catalytic reactors.

**CHEMISTRY (CHEM)**

**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 1215, 1314.

**General Chemistry.** Lab 2. The beginning chemistry course recommended for students in the applied biological sciences. No credit for students with credit in 1014, 1314.

**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 1515.
1314  (L)General Chemistry. Lab 2. Prerequisite: MATH 1012 or one and one-half units of high school algebra. This beginning chemistry course is 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, 1215.

1515  (L)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 and MATH 1515 or 1715. Modern theories of solutions, separation techniques and methods of analysis. No credit for students with credit in 3324.

2122 Qualitative 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 3524.

2344 (N)Organic Chemistry. Prerequisite: 1225 or equivalent. For students in agriculture taking 3-semester sequence 2344-BIOCH 3543. Fundamentals of organic chemistry with an introduction to biologically important molecules. No credit for students with credit in 2463, 3015 or 3053.

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: 1515 or equivalent. Hydrocarbons and their derivatives, including specific compounds of theoretical, biological or industrial importance. No credit for students with credit in 2344, 2463, 3053 or 3112.

3164 Physical Science for Teachers. Lab 2. Prerequisites: 1314, GEOL 1114, PHYSIC 1114. Capstone course in physical science for potential science teachers. Review of physics and chemistry principles and phenomena as related to the curriculum.

3234* Introducory 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 2344, 2463 or 3015.

3253 Descriptive Inorganic Chemistry. Prerequisite: 1225 or 1515. Structures and properties of the elements and their compounds in the broadest sense which includes the modem technologically important materials, organometallics, and inorganic substances of biological significance.

3344 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 3354.

3522* Physico-Chemical Measurements. Lab 6. Prerequisites: 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.


4333* Inorganic Chemistry. Prerequisite: 3 hours of physical chemistry. Valence, periodic system, complex ions and the more important classes of inorganic compounds.

4482* 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* Thesis. 1-6 credits, maximum 6. Investigations, chiefly experimental, with necessary conferences. Familiarizes the student with methods used in research in chemistry.

5011* Graduate Seminar. Preparation and presentation of seminars usually on subjects of current interest taken from the literature. Compilation of 1 credit hour required for M.S. degree.

5103* Chemical and Physical Separations. Prerequisite: one year of physical chemistry. Principles of bulk and multi-stage separation methods: chromatography, liquid-liquid extraction and zone melting.

5113* Equilibrium and Kinetics In Analytical Chemistry. Prerequisite: one year of physical chemistry. Physical and chemical principles of equilibrium and kinetics as applied to technical problems.

5220* 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.

5222* 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; organic and natural organic polymers.

5282* Radiochemistry. Prerequisites: 1515 and PHYSIC 4213. Chemical aspects of nuclear reactions and reactors. Separation techniques: chemical effects of nuclear energy; isotope exchange and tracer applications.


5362 Organic Reactions. Prerequisite: 5323. A continuation of 5323, covering more advanced material.


5443 Mechanism and Structure in Organic Chemistry. Prerequisites: 3153 and 3553. Relationship of properties of organic compounds to their structure; mechanisms of organic reactions.

5563* Chemical Thermodynamics I. Prerequisite: 5353. Statistical and classical thermodynamics applied to chemical systems.

5623* Quantum Chemistry I. Prerequisite: 3553. Fundamentals of quantum mechanics, including classical mechanics, wave representation of matter, the Schrödinger equation and atomic structure.

5723* Solutions of Electrolytes. Prerequisite: 3553. Thermodynamics of solutions of electrolytes; cell potentials, transmission conductance, diffusion; dielectric constants and their theoretical interpretation.


6000 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 faculty advisor.

6011* Advanced Seminar. Prerequisites: 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.

6050* Special Topics in Analytical Chemistry. 1-6 credits, maximum 6. Supervised study of topics and fields not otherwise covered.

6103* Electroanalytical Chemistry. Prerequisite: 4024. The theory, practice and instrumentation in various areas of modem electroanalytical chemistry.

6113* Analytical Spectroscopy. Prerequisite: 4024. Survey of selected topics in analytical applications of spectrophotometric techniques. Fundamental concepts as well as current trends in research, including instrumentation.

6153* Mechanism of Organic Reactions. Prerequisite: 5443. Theories of organic reactions; predictions of their course.

6323* Heterocyclic Compounds and Medicinal Chemistry. Prerequisite: 5652. Preparations and reactions of cyclic organic compounds containing atoms other than carbon in the ring. Modern synthetic techniques as well as indus trial methods for the preparation of heterocycles, especially those with medicinal properties and uses and related to structural characteristics of the compounds.

6353* Chemistry of Natural Products. Prerequisite: 5323. Complex naturally occurring organic compounds such as alkaloids, terpenes and steroids.

6420* Special Topics In Organic Chemistry. 1-9 credits, maximum 9. Prerequisite: 3153. Deals with topics not covered in other courses.

6453 Chemical Kinetics. Prerequisite: 3553. The kinetics of chemical reactions and their theoretical interpretation.

6523* Quantum Chemistry II. Prerequisite: 5623 or PHYSC 5613. Molecular quantum mechanics and chemical bonding.

6553* Molecular Spectroscopy. Prerequisite: 5623. Spectra and structure of molecules.

6623 Chemical Thermodynamics II. Prerequisite: 5563. A continuation of 5563.

6650* 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)**


1225 (H)Elementary Chinese II. Prerequisite: 1115 or equivalent proficiency. Continuation of 1115. Mastery of basic grammatical patterns and conversational principles, and increasing repertory of Chinese characters.
3823 Human Impact on the Environment. The activities of humans and how they affect the aquatic, terrestrial and atmospheric environment.

3833 Hydraulics. Prerequisites: CHEM 1515, PHYS 2414. Basic hydraulic principles and their applications in civil engineering problems. Fundamental properties of water, water pressure and pressure forces, water flow in pipes and networks, water pumps, water flow in open channel hydraulics of wells, hydraulic similitude and model studies, and water measurements. Basic principles and concepts will be highlighted by laboratory demonstrations and computer solution techniques.

3843 Introduction to Hydrology I. Prerequisites: CHEM 1515, PHYS 2414, CIVEN 3833 or AGEN 301. Basic principles of surface and groundwater hydrology and their application in engineering problems. Topics include the hydrologic cycle, weather and hydrology, precipitation, stream flow hydrographs, hydrologic and hydraulic stream routing, probability of hydrologic events, application of hydraulic models. Same course as AGEN 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 project management, verbal and written communications, bidding documents, bidding procedures, professional ethics, and professional liability. Also advantages of professional registration and membership in professional organizations.

4273 Construction Planning and Scheduling. Lab 3. Prerequisite: 3833. Introduction to the design of structural steel members and connections in accordance with the strength design requirements of the ACI Building Code.

4630 Surveying. Lab 3. Prerequisite: MATH 1613 or 1715. First course in a measurement science. Introduction and application of plane surveying processes and problems related to linear and angular measurements, differential leveling, traverses and topographic surveys. Computer applications to surveying calculations.

5100 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.

5102 Civil Engineering Research. 1-6 credits, maximum 6. Prerequisite: graduate standing and approval of major professor. Research and investigations other than thesis studies.

5400 Engineering Problems. 1-3 credits, maximum 6. Prerequisite: enrollment in class. Problems of particular interest to students. Approval of student advisor and major professor. Recommended for graduate students in the field of applied science.

5113 Advanced Strength of Materials. Prerequisite: 3114. General states of stress and strain, theories offailure, energy principles, beam bending, shear center, torsion of prismatic shafts, beams on elastic foundations, plates and shells, elasticity stability.


5223 Systems Analysis for Civil Engineers. Prerequisite: senior or graduate standing. Synthesis of systems modeling and simulation techniques, mathematical optimization procedures, 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.

5333 Environmental Engineering. Prerequisites: MATH 2631. Advanced structural mechanics from the standpoint of virtual work, energy principles and variational calculus applied to the analysis of structures, mechanisms, dynamics, and vibrations.

5414 Classical Methods of Structural Analysis. Prerequisite: 3413. Advanced analysis of indeterminate 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, plate 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 and load distribution, analysis, design, and bridge rating. Emphasis on topics of special interest to students.

5603 Design and Planning of Airports. Prerequisites: CHEM 1515, Engineering aspects of the life support system; the carbon–oxygen cycle; cycling of nitrogen, sulfur and phosphorus; the hydrolitic cycle; the nature of organic matter, composition of organic matter; hydrocarbons, carbohydrates, lipids, proteins, nucleic acids. Oxidizability and energy content of organic matter. Introduction to chemical oxygen demand (COD); living organic matter as an engineering material.
Mechanics In Engineering Design and Construction.

5743 Soil-Structure Interaction. Prerequisites: 3713 and senior or graduate standing in civil engineering. The mechanical interaction effects between soils and structures using suitable engineering procedures such as finite differences and finite element methods. Civil engineering problems where interaction effects are most dominant. Field testing, numerical models for piles (bearing capacity of foundation), axially- and laterally-loaded piles, cantilever and anchored sheet pile walls.

5753 Engineering Soil Stabilization. Prerequisites: 3713 and 4711. Theoretical and practical aspects of engineering soil stabilization as a method for improving and upgrading subgrade and substructure soils for engineering purposes. Use of lime, fly ash, portland cement, asphalt, and other physical and chemical admixtures. Application of principles and techniques of soil stabilization such as preloading, deep compaction, injection, and reinforcement.

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 concrete construction such as for parking areas, streets and highways; cost of mixing concrete, subgrade preparation, forms, finishing, sawing and curing.

5783* Contract Administration. Prerequisite: graduate standing or consent of instructor. Methods and techniques for tracking, and control of construction projects. Conversion of cost estimate to cost control. Computer applications for project tracking of costs, man-hours, and quantities of work in place. Evaluation of current research findings related to contract implementation.


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. Ordely development and city plan organization. Evaluation and planning of 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 II. Prerequisite: 3843. Physical phenomena of the surface water hydrospheric processes. Derived and empirical models for infiltration, base flow, and unsteady flow routing will be presented. Basic flood analysis techniques will also be studied.

5853* Fundamentals of Biochemistry and Microbiology for Environmental Engineering. Prerequisites: adequate background in chemical and microbiology. Advanced treatment of microbial processes and biochemical reactions applied to environmental engineering analysis and design.

5863 Advanced Unit Operations in Environmental Engineering. Prerequisite: 4833. Theory and design of advanced physical-chemical and water wastewater treatment processes.

5873 Air Pollution Control Engineering. Causes, effects and control of atmospheric pollution.

5623* Terrain Analysis. Lab 3. Prerequisites: basic courses in soil mechanics and geology. Prediction of geotechnical engineering characteristics of geological landforms from remote sensing imagery. Emphasis on photo-interpretation. Training and practice of this media in land-use applications and environmental problems.


5643* Asphalt Materials. Lab 3. Prerequisite: graduate or senior standing. Composition, characteristics and uses 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 Planning. Prerequisite: 3633. Determination of demand for transportation and models for demand forecasting. Performance characteristics of transportation systems and models for performance. Quantitative analysis of multimodal transportation network including prediction of flow patterns and service reliability. Evaluation of transportation, and political impacts of transportation decisions. Application of systems analysis techniques to the generation, evaluation, and selection of alternative transportation systems.


5693* Pavement Design. Prerequisite: 3633. Basic principles and current methods of pavement design. Soils and paving materials and their behavior under vehicle loads. Determination 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 plasticity, chemical modification, compaction, relative density, in-place density, consolidability, and shear strength. Emphasis on shear strength testing of cohesoless and cohesive soils for various design conditions.

5713* Soil Mechanics. Prerequisite: 3713 and 4711. Application of soil mechanics principles and concepts in geotechnical areas of permeability and seepage, settlement analysis, bearing capacity, lateral earth pressures and retaining walls, slope stability, and metastable soils.

5723* Foundation Engineering. Prerequisite: 3713 and 4711. Types of structural foundations including footings, mats, rafts, piles and drilled shafts. Site characteristics, exploration programs, field data, test results and construction methods and methods as basis for selection of type of foundation and design. Geotechnical design procedures and considerations.

5733 Geotechnical Engineering Design and Construction. Prerequisite: adequate background in civil or architectural engineering or geology. Stresses, stress variations and soil interaction. Development of computer-based tools and programs for use in geotechnical design and construction. Rock mechanics consideration in the design and construction of engineering works.

5743* Solid Waste Management. Theory, design and operation of solid waste collection, disposal and reclamation systems.

5763 Hazardous Waste Management. Past and current hazardous waste management practices. Areas of concern and alternative approaches. An overview of important regulations and regulations.


5821* 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: 3633. Design of water and wastewater treatment systems.

5953 Biological Wastewater Treatment Design. Lab 3. Prerequisite: 3633 or graduate standing. The use of laboratory and pilot plant studies in the design of biological waste treatment plants. Various methods of selecting-up pilot plant studies to full-scale plants presented.

5963* Open Channel Flow. Prerequisite: 3833. Open channel hydraulics, energy and momentum concepts, resistance, channel controls and transitions, flow routing, and sediment transport.

5973* Groundwater Quality. Prerequisite: graduate standing or 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 30. Independent research under the direction of a member of the graduate faculty by students working beyond the level of Master of Science degree.

6101 Seminar. 1-6 credits, maximum 12. Prerequisites: consent of instructor and approval of the student’s advisory committee. 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 by classical and numerical methods. Analysis of singly and doubly curved shells of membrane theory. Introduction to shell bending theory.

6433 Structural Dynamics. Prerequisites: 5113 and 5413. Analysis of bars, frames, towers, multiistory building and truss structures subjected to dynamic disturbances; inversion of the lumped and distributed mass systems; natural frequencies, response spectra, applications to blast loading and earthquake analysis.
and watersheds.

and finite-element methods to predict water flow and

prerequisites: 5843 and 5913. Application of finite-difference

Modeling of Water Resources Systems. Prere-

6313.

6843, or AGEN 4313 and STAT 4053 or equivalent.

6833

sanitary engineering analysis and design.

relationships in control of the aqueous environment and in

and biological principles in establishing quantitative rela-

*6823

processors; elementary and advanced applications in

structures. Properties of phreatic surfaces. Seepage

Seepage and Groundwater Flow. Prerequisite: 3713.

Seepage through earthen dams and around hydraulic

structures. Properties of phreatic surfaces. Seepage

pressures, piping and boiling. Construction and utiliza-

of flow nets. Groundwater mechanics applications

including flow characteristics and changes in flow due to

pump and drain systems.

6723

Advanced Geotechnical Engineering. Prerequi-

sites: 3713 and GEOL 3024. Geologic, structural, and

engineering significance of ground failure hazards such as

slope movements, streambank erosion, subsidence,

meta-stable soils and earthquakes. Emphasis on

qualitative identification of ground failure hazards with

quantitative assessement and remedial actions.

673* Selected Topics in Geotechnical Engineering. Prere-

quisite: graduate standing and a geotechnical engineering,
or consent of instructor. Recent developments in geotechnical engineering and selected

tectonic areas only briefly dealt with in prior courses.

676* Construction Management. Prerequisites: 4273 and

4763. Management of the design and construction of civil

engineering projects. Early project development and form-

al and structural elements. Development of plans and

 specifications, equipment and materials for construction of
general and special structures. Emphasis on the

practical application of principles and practices in the

construction field.

6853 Enviromental Concepts and Analysis II. Prere-

quisite: 5853. Advanced application of physical, chemical

and biological principles in establishing quantitative rela-

tionships in control of the aqueous environment and in

sanitary engineering analysis and design.

6833 Advanced Biological Waste Treatment Design. Prerequisite: 5953. Use of kinetic models in the design

of biological wastewater treatment plants.

6843 Stochastic Methods in Hydrology. Prerequisites: 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.

6953 Modeling of Water Resources Systems. Prere-

quisite: 5843 and 5913. Application of finite-difference and

finite-element methods to predict water flow and

chemical and biological water quality in saturated-

unsaturated ground waters, streams, lakes, urban areas, and

watersheds.


6923 Industrial Wastes Engineering. Theory and methods of

treating and reducing industrial wastes.

6933 Operational Control of Wastewater Treatment Plants. Prerequisites: 5853 and 5953 or consent of

instructor. The use of scientific and engineering principles for the management of wastewater treatment facilities.

CLOTHING, TEXTILES AND MERCHANDISING (CTM)

1103 Basic Apparel Construction. Lab 4. Basic apparel con-

struction techniques. Problems including basic fit, pat-

tern selection and alteration, use of plaid, use of sewing

machines and Sergers, and basic sewing techniques.

1123 Evaluating Apparel Quality. Development of evalua-

tion skills in determination of apparel quality. Identification and recognition of garment style variations.

2110 Fashion Showmanship. 1 credit, maximum 8. Prepara-

tion, production and evaluation of special fashion-related events. Professional learning experiences will include

modeling techniques, organization and directing pro-

cedures.

2113 Applied Design in the Clothing Industry. Lab 4. Appreciation of art elements and design principles;

determination of design in application of design within

various segments of the clothing industry.

2203 Intermediate Apparel Construction. Lab 4. Prere-

quisite: 1103. Development of skill in construction of apparel. Preparation and development of garments for a

specific figure, inserting a lining, and couture techniques on

special fabrics.

2433 Fashion Innovation and Marketing Processes. The

process of fashion innovation; variables of fashion affec-

ting production and distribution of consumer goods; development of present structure in the fashion industry.

2573 (L)Textiles for Consumers. Lab 2. Consumer-oriented

study of textiles emphasizing fibers, care and ser-

viceability of apparel and household fabrics.

3002 (S)Professional Image and Dress. Role of appearance

dress in creating a professional image for men and

women. Figure and wardrobe analysis, professional

clothing needs, individualized clothing decisions. Not open to CTO majors.

3013 Flat Pattern Design. Lab 4. Prerequisites: 2203 and

MATH 1513. Interpretation of dress design developed through the medium of flat pattern; introduction to pat-

tern drafting.

3102 Fashion Sketching. Lab 4. Prerequisites: 2113 or 3

credit hours of art and completion of 60 credit hours. Prin-

ciples and techniques of sketching in the fashion field.

3113 (S)Clothing in an Ecological Framework. Relationship

between human beings and their dress within the environ-

ment. Relative affects of custom, technology and eco-

nomics of fashion.

3153 Family Clothing. Use of family resources and the study

of clothing needs at various stages of the family life cycle.

3203 Functional Clothing Design. Lab 4. Prerequisites:

2573, 3103 and 4 credit hours of chemistry. Problem-

solving approach to functional clothing design for specific market segments (athletic sportswear, occupational clothing, children's wear, clothing for the

handicapped) including performance evaluation of selected materials using standard methods of textile testing.

3213 (H,L,S)Heritage of Dress. Prerequisite: 3 credit hours of

history. Survey of historic modes of dress as they

reflect the social, economic and cultural life of a people. Application of design principles to modern dresses.

3433 Fashion in Retailing. Prerequisites: 2433, ACCTG 2103,

ECON 1113. Marketing structures at retail level; job

descriptions and responsibilities at management level;

financial and control functions.

3534 Decorative Fabrics. Lab 4. Prerequisite: 3 credit hours in

art. Historic and contemporary textile designs. Crea-

tion of textile designs using personal inspirations, cultural

expressions and a variety of techniques.

3643 Apparel and Accessories for Special Markets. Prere-

quisites: 2433, PSYCH 1113, SOC 1113, and comple-

tion of 60 credit hours. An analysis of the apparel and

accessories needs of specialized market segments and the

products designed to meet these needs, with considera-

gion given to both product design and merchandising.

3853 Merchandise Display Essentials. Lab 2. Prerequisites:

2113, 2433 and completion of 60 credit hours. Study and

application of principles and practices in arranging and

displaying merchandise for commercial and educational purposes. Supervised experience working with merchan-

dise from retail stores.

3991 Pre-internship Seminar. Prerequisites: 24 credit hours of required CTO courses and SPCH 2713. Skills

require a knowledge of marketing and ability to

execute a directed, practical experience in a work situation within the fashion industry.

3994 Internship. Lab 6. Prerequisites: 3991 and consent of

instructor. Directed practical experience in an approved work situation related to the fashion industry.

4011 Post Internship Seminar. Prerequisite: 3994. Study and comparison of student work experiences. Individual

student conferences, review of merchant supervisor reactions.

4152 Design Through Mass Production. Lab 4. Prere-

quisite: 2433, 3013, MKTG 3213, SPCH 2713. Design-

ing, costing, producing, and marketing apparel in a

simulated production setting.

4243 Draping. Lab 4. Prerequisite: 2203. Interpretation of gar-

ment design developed through the medium of draping

on dress forms.

4303* Fashion Buying and Management Procedures. Prere-

quisite: completion of 90 credit hours. Successful

merchandising of fashion goods. Retail management and supervision responsibilities. Case studies, apparel markets and consumer demand.

4363 Fashion Promotion Media. Prerequisites: 2433 and

completion of 60 credit hours. Advertising and other

special-purpose media used in the promotion of fashion

merchandise. Study and application of procedures used in

planning, evaluating and directing effective sales pro-

motion activities.

4403 Creative Costume Design. Lab 4. Prerequisites: 3213,

3433, 3534, 3643 or consent of instructor. Application of

design principles and construction techniques in the

development of original designs.

4453 Apparel Shop Entrepreneurship. Prerequisites: ECON

1113 and completion of 90 credit hours. In-depth study

and development of individualized plans for opening a

women's or men's apparel shop including entrepreneur-

ship design development, marketing planing and buy-

ing, operations and management, and advertising and

promotions.

4523 Critical Issues in Clothing, Textiles and Mer-

chandising. Prerequisites: ECON 1113 and senior standing.

Relationships among the clothing, textiles and merchan-

dising industries and their external environment. Special

emphasis on current issues and trends, forecasting, career contacts, and application of creative decision-

making skills.
Computer Science

3451 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.

3883 Social Issues in Computing Sciences. Prerequisites: 9 credit hours COMS, ENGL 3323, or consent of instructor. Application of knowledge to corporate, political, personal and ethical 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.

4113 Techniques of Computer Science for Science and Engineering. Prerequisites: one year of calculus and senior or graduate standing. For graduate students (ECEN 5123). Sophomore and junior level 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; geometrical transformation; data structures for graphic representation; viewing in three dimensions; representation of 3D shapes; hidden edge and hidden surface removal algorithms; shading models.

4223 Management Information Systems. Prerequisites: 2123, 3443 or ECEN 3213. Principles underlying software design methodology. 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 square approximation, roots of equations, integration, 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 ECEN 3213. Principles underlying software design methodology. Standards for software design. Design decisions. Survey of software design literature. Solution of a large scale software design problem in a simulated working environment. Same course as ECEN 4273.


4323 Operating Systems I. Lab 2. Prerequisites: 3443, STAT 2613. Dynamic procedure activation, system structure, system measurement and evaluation, memory management, process management, automatic and manual system recovery procedures.

4341 Data Structures and Information Processing. Lab 2. Prerequisite: 2133. Storage, structures, data and information structures, list processing, trees and tree processing, graphs and graph processing, searching, sorting.

4361 Organization of Programming Languages. Prerequisites: 2133, 3203. Programming language constructs. Run time behavior of programs; Language definition structure. Control structures and data flow. Examples from ALGOL 60, ALGOL 68, APL, SNOBOL 4, LISP and RPG.


4444 Compiler Writing I. Lab 2. Prerequisite: 3443. Syntax and semantics of procedure-oriented languages and theory of translation techniques used in their compilation. Study of languages for particular application areas, including nonalgebraic languages.

4507 Special Topics in Computing. 1-3 credits. Prerequisite: 3443. Advanced topics and applications of computer science. Typical topics include operating systems, multiprocessor systems, programming systems or various mathematical and statistical packages. Designed to allow students to study topics not provided in existing courses.

4993 Senior Honors Project. Prerequisites: departmental approval, senior standing. honors program participation. A guided reading and research program ending with an honors project under the direction of a faculty member, with a second faculty reader, and an oral examination. Required for graduation with departmental honors in computing and information science.

5000 Research and Thesis. 1-6 credits, maximum 6. Prerequisite: consent of professor. A student studying for a master's degree who elects to write a thesis or a report must enroll in this course.

5013 Linear Programming. Prerequisites: MATH 3013 or INDEN 4014; FORTRAN. Simplex algorithm to solve deterministic linear optimization models considering maximum and minimum objectives, degeneracy, alternative optima and no feasible solutions. Revised simplex procedures. Duality theory, economic interpretations, dual simplex, special problems. Focus on the development, analysis and parametric programming. Special cases of linear optimization problems and underlying mathematical foundations. Large-scale problems including computational considerations. Same course as INDEN 5013.

5070 Seminar and Special Problems. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Open to all students 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.

5144 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. Architecture, circuit design, data representation, multiprocessor systems. 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 ECEN 5253.


5333 Compiler Writing II. Prerequisite: 4444. Continuation of 4444. Theory and practice of compiler writing techniques. Compiler writing systems. A formal approach to compiler languages.

5413 Data and Storage Structures. Prerequisite: 3444. 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. Prerequisite: 4244, 4242. Storage, classification and retrieval of information, data bases, errors, multi-key files, indexing, mechanics of file reorganization, search strategies.

5513 Numerical Analysis I. Prerequisite: 4253 or MATH 4253. Algorithms and error analysis; solutions of equations; curve fitting and approximation theory. Same course as MATH 5513.

5543 Numerical Analysis II. Prerequisites: 4253 or MATH 4253 and 4853. 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, COMS 4253 or MATH 4253. Theoretical and computational methods associated with matrix algebra, linear algebraic equations and algebraic eigenvalue problems. Same course as MATH 5553.

5653 Automata and Finite State Machines. Prerequisites: 5313 and 5613 or MATH 3113. Preliminary model, state diagrams and flow tables, equivalent states and equivalent machines. Formal grammars, context-free languages and their relation to automata and grammatically restricted machines, computability and recursive function. Same course as MATH 5653.

5663 Computability and Decidability. Effectiveness, primitive recursive, general recursiveness, recursive functions, equivalence of computability, definability, decidability, and recursive algorithms. Same course as MATH 5663.

5712 Computer Operations. Prerequisite: graduate standing in computer science and consent of instructor. Experiments in the operation of computers and peripheral equipment.

6000 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 to problems such as the Traveling Salesman problem and the linear programming. Same course as MATH 6023.

6240 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 composition, alignment networks, conflict-free memories, bounds on computation time.

6253 Advanced Topics in Computer Architecture. Prerequisite: 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.

6300 Advanced Topics in Programming Languages. 2-6 credits, maximum 12. Prerequisite: 5313. Interpreter models of programming language semantics, variants, definition language, lambda calculus, LISP definition; Knuth semantic systems and their formulation, translation and implementation semantic. May be repeated with change of topics.

6530 Advanced Topics in Operating Systems. 2-6 credits, maximum 12. Prerequisite: 5323. Design and analysis of operating systems. Concurrent processes, synchronization, scheduling, models of auxiliary storage, memory management, virtual systems, performance algorithms. May be repeated with a change in topics.
CONSTRUCTION MANAGEMENT TECHNOLOGY (CONST)

1213 Introduction to Building Construction. Lab 3. Fundamentals of light building construction; techniques of architectural drawings; methods and materials used in the development of plans, elevations, sections, details, and construction drawing interpretation.

1333 Construction Practice. Prerequisite: 1213. 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. Lab 4. Prerequisites: 1213, 2334. Interpretation of construction drawings for commercial and heavy construction projects together with fabrication drawing and submittal data review.

2273 Computer Application In Construction. Lab 3. Prerequisites: 1213, 2334, MATH 1513, 1613. Disk operating systems, introduction to programming in Basic, word processing, spreadsheets. Applications to the construction industry.

2334 Fundamentals 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.


2362 Estimating I. Prerequisite: 2252 or 2253. Quantity takeoff. Emphasis on excavation, formwork and concrete, masonry, rough carpentry and miscellaneous specialty items.

2363 Estimating II. Prerequisite: 3233. Emphasis on excavation, formwork and concrete, masonry, rough carpentry and miscellaneous specialty items.


3263 Estimating IV. Prerequisite: 3262. Emphasis on the development of estimating staff and the coordination of the estimating function with the project management function.

3452 Mechanical Equipment of Buildings. Prerequisite: PHYSC 1114. Plumbing, heating and air conditioning systems as applied to residences and commercial buildings.

3462 Electrical Equipment of Buildings. Prerequisite: PHYSC 1114. 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: MECDT 3323. Analysis and design of reinforced and prestressed concrete in accordance with the ACI building code.

3714 Soil Mechanics Technology. Lab 3. Prerequisites: GENT 2323 and MECDT 3323. Physical and mechanical properties of soils, and tests appropriate for construction management students.

4050 Advanced Construction Management Problems. 1-6 credits, maximum 6. Prerequisites: junior standing and consent of instructor. Special problems in construction management.

4263 Estimating II. Lab 3. Prerequisite: 3263. Extensive use of actual contract documents for quantity take-off, pricing and assembling the bid for several projects. Use of computers in estimating.

4273 Computer Estimating. Lab 3. Prerequisite: 4263. Various software programs applied to estimating for building construction. Automated take off (Digitizer) systems.


4293 Construction Manager Concepts. Prerequisite: 4283. Principles and applications to manage the construction process. The expanding role of the construction manager in the construction industry.

4781 Seminar. Prerequisite: senior standing and consent of instructor. Career placement and promotion within the construction industry. Aspects of the collective bargaining process. Functions of committees as service to the industry.

CURRICULUM AND INSTRUCTION EDUCATION (CIED)

1230 Reading and Study Skills for College Students. 1-4 credits, maximum 4. Lab 1-4. Instruction and laboratory experience for the improvement of reading rate, vocabulary, comprehension and study skills. Graded on pass-fail basis.

2113 (S) The School in American Society. Prerequisite: sophomore standing. The school as a major institution in its political, economic and social setting. The nature and extent of equality of educational opportunity in the U.S. Socialization of students, social class and education, the poor and the schools, ethnic groups and their school experiences, the nature of multicultural education, mainstreaming (PL 94-142), the education of women, the poor and the schools, ethnic groups and their school experiences. Graded on a pass-fail basis.

3122 Utilization of Instructional Media. Familiarizes students with a broad range of instructional media and with principles and techniques related to their selection, utilization and evaluation.

3132 Microcomputer Technologies for Education. Lab 2. Introduction to computer technology, microcomputer hardware and software, and principles related to the design of instructional software packages.

3153 Teaching Mathematics at the Primary Level. Lab 2. Prerequisite: MATH 1314, 1513 or 1715. Developmental levels in selection and organization of content and procedures for primary mathematics education.

3283 Foundations of Reading Instruction. Prerequisite: full admission to Teacher Education. Current theories of developmental reading instruction in primary and intermediate grades, including appropriate methods and materials.

3430 Early Lab and Clinical Experience In Elementary Education II. 1-2 credits, maximum 3. Lab 3-6. Prerequisite: 2450. Directed observation and teaching in schools, kindergarten through grade eight. Concurrent supervised experience in multicultural education and mainstreaming programs. Graded on a pass-fail basis.

3450 Early Lab and Clinical Experience In Elementary Education III. 1-2 credits, maximum 6. Lab 3-6. Prerequisite: 3430. Advanced clinical experience in schools, kindergarten through grade eight. Concurrent seminar includes formal study of instructional planning. Graded on a pass-fail basis.

3620 Field Experiences in the Middle School. 1-4 credits, maximum 4. Lab 2-8. Prerequisites: 2450 and consent of instructor. Seminars, directed observation and participation in a particular subject area of the middle school (grades 5-9). Experience in meeting the mental, social, physical and cultural differences among middle school children. Graded on pass-fail basis.

3710 Field Experiences in the Secondary School. 1-3 credits, maximum 3. Lab 2. Prerequisites: consent of instructor and completion of speech proficiency examination. Seminars, directed observation and participation in a particular subject area of the secondary school. Develops experience in meeting the mental, social, physical and cultural differences among children. Graded on a pass-fail basis.

3713 Structure and Utilization of a Mathematics Laboratory. Lab 1. Prerequisite: full admission to Teacher Education. Historical background, future trends, theoretical and practical considerations, construction of laboratory materials and evaluation procedures in a mathematics laboratory. For experienced and inexperienced classroom teachers, superintendents, principals and mathematics supervisors.

3813 Topics of Middle School Mathematics. Prerequisite: consent of instructor. Strategies for teaching the topics of the middle grades and the mathematics basic skill areas of the middle grades (grades 5-9).

4000 Field Studies In Education. 1-4 credits, maximum 4. For students who need independent study and/or field experiences, such as spending a semester in an experimental program working with handicapped children in schools, in-depth studies in research projects, internships with school personnel.

4003 Teaching Fundamental Concepts of Mathematics. Prerequisite: full admission to Teacher Education. Techniques and concepts of elementary mathematics and the integration of contemporary mathematics textbooks. Emphasizes calculating with modern technology in the classroom.

4013 Humanizing the Educational Process. Provides the student with a greater personal awareness and understanding of the dynamics of human relatedness within the classroom teaching-learning process.

4023* Children's Literature. Survey, evaluation, selection and utilization of materials for children; extensive reading with emphasis on children's books which meet the needs and interests of children through grade six.
4033 Alcohol and Drug Education. Use and misuse of alcohol and drugs, physiological and psychological effects of drugs and the attendant problems of abuse. Guest speakers from several disciplines lend an interdisciplinary approach. Current education materials and rehabilitation programs.

4043 Classroom Applications of Microcomputers. Lab 2. Prerequisite: 3152 or equivalent. Instructional computing course for educators; principles involved in programming a microcomputer; extended applications of tool software and telecommunications; issues and strategies for planning and implementing computer technologies in the schools.

4053 Teaching Geometry in the Secondary School. Prerequisite: concurrent enrollment in MATH, full admission to Teacher Education. Overview of the present secondary geometry curricula and future trends. Axiomatic development of Euclidean geometry, proofs and transformational geometry from the perspective of the secondary mathematics teachers. Study and comparison of contemporary basic mathematics textbooks. Recommended to be taken concurrently with 3710 and MATH 4043.

4063* Teaching Mathematical Modeling. Prerequisites: concurrent enrollment in NATH, full admission to Teacher Education. Strategies for teaching mathematical modeling. Problem solving and development of mathematical models to illustrate classroom topics.

4113* Multi-media Program Production. Prerequisite: 3122. Design and production of synchronized automatic sound slide programs coordinated with subject matter content. Includes development of presentation procedures, audio recording and sound-mixing methods, graphics, and synchronizing techniques. Individual projects required.

4123 History of Education. The development of major educational ideas and programs with emphasis on the growth of public education in the United States from the Colonial period to the present.

4142 Teaching Mathematics at the Intermediate Level. Lab 0-2. Prerequisite: 3153. Selection and organization of content, procedures for instruction, and evaluation of outcomes in teaching the mathematics of the intermediate grades. Some attention to instruction in upper grades of the elementary school.

4142 Teaching LOGO In the Schools. Lab 0-2. Prerequisite: 3132 or equivalent. Instructional computing course for educators using LOGO language. Includes methods and instruction techniques for teaching LOGO in grades K-12.

4213 Introduction to the Visual Arts in the Curriculum. Prerequisite: 2113 or 2213. Provides an understanding of the theoretical basis for the use of art activities in developing sensory perception and aesthetic sensitivity as an integral part of the curriculum. Includes a wide range of opportunities for student involvement in experimentation and exploration with a variety of two- and three-dimensional art media. Emphasis is on both creative expression and evaluation of the visual arts in the home, school and community as a vital aspect of instruction in the school, preschool level through grade eight.

4223 Application of Advanced Technologies to Instruction. Prerequisite: 3122 or 3132 or consent of instructor. Production, utilization, application of media available through advanced technologies. Systematic instructional technology approach to teaching-learning process.

4233 Introduction to Reading Problems. Lab 1. Prerequisite: 3283. Identification and treatment of reading problems in the classroom including group and individual diagnostic procedures. Laboratory experiences are required.

4250* Language Arts In the Elementary School Curriculum, 1-4 credits, maximum 4. Lab 0-6. Prerequisite: full admission to Teacher Education. The purposes, selection and organization of content, teaching and learning procedures, and evaluation of outcomes in elementary school listening, speaking and writing.

4260 Skill Development in the Reading Program. 1-3 credits, maximum 3. Lab 0-4. Prerequisite: 3283. Relation between reading skills, child development and curriculum, and instructional strategies for sequential skill development in reading.

4270 Reading In Content Areas In The Elementary School. 1-3 credits, maximum 3. Lab 0-4. Prerequisite: 3283. Integration of reading instruction in the elementary school curriculum with emphasis upon application of reading to various content areas.

4280 Informal Practices in Reading. 1-3 credits, maximum 3. Prerequisite: 3283 or equivalent. Teaching aids and methods of informal instruction in reading utilizing the language experience approach and individualized voluntary reading procedures. Informal evaluation of reading development.

4290 Reading in the Elementary School. 1-4 credits, maximum 4. Lab 0-6. Prerequisites: 3283, 4233. Theory, methods and diagnostic procedures of reading in the elementary classroom. Taken concurrently with student teaching.

4320 Social Studies in the Elementary School Curriculum. 1-4 credits, maximum 4. Lab 0-6. Prerequisite: full admission to Teacher Education. Purposes, selection and organization of content, teaching and learning procedures and evaluation of outcomes in elementary social studies.

4343 Science In the Middle School Curriculum. Prerequisites: concurrent enrollment in 3620 and CHEM 3604 and full admission to Teacher Education. Objectives, organization, and selection of science content and the analysis of teaching, learning, and evaluation procedures for middle school science.

4350 Science In the Elementary School Curriculum. 1-4 credits, maximum 4. Lab 0-6. Prerequisite: full admission to Teacher Education. The purposes, selection and organization of content, teaching and learning procedures and evaluation of outcomes in elementary school science.

4363 Design and Management of the Elementary School Classroom. Prerequisites: ABSED 3113, FRCD 3253, or consent of instructor, and full admission to Teacher Education. Design and management of the physical, social, intellectual, cultural, special needs, and learning materials aspects of the school classroom, kindergarten through grade 8. Purposes, selection, and organization of instruction management systems and teaching approaches.

4450 Internship in the Secondary Schools. 1-12 credits, maximum 12. Lab 0-12. Prerequisites: 3710, 4233, 3450 full admission to Teacher Education. Advanced clinical experience as associate (student) teacher in schools, kindergarten through grade eight.

4460 Kindergarten-Primary Education: Methods. 2-3 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 content 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. Computer applications in teaching microcomputer technology in teaching middle school science; microcomputer interfacing, simulation, and interactive videodisk.

4713 Methods and Materials in the Secondary School I. Prerequisites: full admission to Teacher Education. The purposes, selection and organization of content, teaching and learning procedures, and evaluation of outcomes in grades 7-12 are 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 language, visual and performing arts, journalism, language arts, mathematics, science, social studies, speech/drama.

4720 Internship in the Secondary Schools. 1-12 credits, maximum 12. Lab 3-36. Prerequisites: 2113, 3710, ABSED 3113 or 3213, 4723 and full admission to Teacher Education. 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.

4723 Methods and Materials in the Secondary Schools II. Prerequisites: 4713 or equivalent, verification of student teaching internship placement, and full admission to Teacher Education. 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.

4913 (International Problems and the Role of the SSchool. 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 education in other countries and regions and an appraisal of an enlarged, critical view of American education.

5033 Teaching Foreign Languages In the Schools. Prerequisite: full admission to Teacher Education. Language arts, mathematics, science, social studies, speech/drama.

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, hardware interfacing, and non-instructional software within the school environment. Impact of current issues on instructional computing.

5113* Videotape Television for Instruction. Prerequisite: 4113. Sound-mixing methods, graphics, and syncronizing techniques for the use of art activities in developing sensory perception and aesthetics sensitivity as an integral part of the curriculum. Provides an understanding of the theoretical basis for the use of art activities in developing sensory perception and aesthetic sensitivity as an integral part of the curriculum. Includes a wide range of opportunities for student involvement in experimentation and exploration with a variety of two- and three-dimensional art media. Emphasis is on both creative expression and evaluation of the visual arts in the home, school and community as a vital aspect of instruction in the school, preschool level through grade eight.

4703 Computer Applications In the Middle School Science Curriculum. Prerequisite: 3132 or consent of instructor. Computer applications in teaching microcomputer technology in teaching middle school science; microcomputer interfacing, simulation, and interactive videodisk.
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4473.

4233 and 4290 or 4473. Analysis of Developmental Reading at the Primary Level. Prerequisite: 1-3 credits, maximum 6. Lab 1-3. Prerequisite: consent of instructor. Directed study for master’s level students.

5600 Doctoral Thesis. 1-15 credits, maximum 15. Required of all candidates for the Doctor of Education degree. Credit is given upon completion of the thesis.

5633 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.

5580 Directed Study. 1-3 credits, maximum 3. Lab 1-3. Prerequisite: consent of instructor. Directed study for master’s level students.

5883 Educational Sociology. The manner in which social forces and institutions influence education and the educational system in the United States.

6000 Seminar in Science Education. 1-6 credits, maximum 6. Problems, issues and trends in science education. The focus will be the pre-service or in-service level.

6113 Curriculum of the Elementary School. Contemporary trends, 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 and evaluations.

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.

6683 Developmental Reading and Exceptionality. Prerequisites: 5463 or 5473. Developmental reading needs of various groups of exceptional individuals. Methods and materials of instruction.

6850 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.

6893 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.

6880 Seminar In Reading. 1-6 credits, maximum 6. Lab 1-6. Prerequisite: consent of instructor. Directed reading for students with advanced graduate standing to enhance students' understanding in areas where they wish additional knowledge.

6910 Practicum. 1-6 credits, maximum 6. Prerequisite: consent of adviser. 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, crime, population, and environmental quality. 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.

2023 (S)Introduction to Microeconomics. Prerequisite: 2013. Goals, incentives and outcomes of economic behavior with applications and illustrations from current social issues: operation of markets for goods, services and factors of production; the behavior of firms and industries in different types of competition, income distribution; and international exchange.

3010 Special Topics in Economics. 1-3 credits, maximum 9. Prerequisites: 2023, prior approval of instructor. Analysis of a core topic in Economics. Course content will vary to reflect changing social issues and trends in applied economics.

3023* Mathematical 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.


3123* Intermediate Macroeconomics. Prerequisite: 2023. Development of a theoretical framework for studying the determinants of national income, employment and national 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 banking. Operations of commercial banks and structure and competition of the banking industry. Organization and operation of the Federal Reserve System and its effects on interest rates, employment and prices. An introduction to monetary economics and international banking concludes the course.

4243 (S)Public Finance. Prerequisite: 3 credit hours in economics. The economics of money and banking. Operations of commercial banks and structure and competition of the banking industry. Organization and operation of the Federal Reserve System and its effects on interest rates, employment and prices. An introduction to monetary economics and international banking concludes the course.

4723 Economic Analysis of Law. Prerequisite: 3 credit hours in economics. Use of economic analysis to explain why certain laws exist and to evaluate the effects of different alternative rules of law on economic efficiency and behavior. Emphasis on the economics of the common law, statutory law, property, contracts, torts. Also, production of crime, illegal activity, and punishment. No credit for M.S. and Ph.D. students in economics.

5000 Research and Thesis. 1-6 credits, maximum 6. Workshop for the exploration and development of research topics. Research leading to the master's thesis.

5003 Research Report. Prerequisite: consent of committee chairman. Supervised research for M.S. report.

5101 Research and Independent Studies. 1-3 credits, maximum 10. Prerequisite: consent of departmental committee chairman. Supervised research under a workshop arrangement or supervised independent studies.

5201 General Studies In Economics. 1-6 credits, maximum 6. Economic principles and problems from the general education point of view rather than that of teaching economics. Credits applied only toward Master of Science in Education or Doctor of Education.

5113* Managerial Economics. Economic theory applied 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.

5123 Microeconomic Theory I. Prerequisites: 3113, MATH 2265 or MATH 2713. Contemporary price and allocation theory with emphasis on comparative statics.

5133 Macroeconomic Theory I. Prerequisites: 3123, MATH 2265 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. Contemporary price and allocation theory with emphasis on general equilibrium analysis. Welfare economics.

5223 Mathematical Economics I. Prerequisites: 3113, MATH 2265 or equivalent. Mathematical concepts of single variable and multivariable calculus, topology, and microeconomics of Euclidean space, convergence, linear algebra, optimization theory and the Kuhn-Tucker Theorem with applications in microeconomic models.

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, seasonal correlation, heteroscedasticity, and simultaneous equations.

5253 Econometrics II. Prerequisite: 5243. Advanced econometric theory covering single and multiple equation 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, Wickesell, 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.

5523 Manpower Analysis. Introduction to the manpower field; recruitment, training, motivation and utilization of human resources both within employing units and throughout the economy. Applications of basic concepts, data, tools and techniques of analysis to selected manpower problems.

5543 Labor Market Theory and Analysis. A critical evaluation of the theoretical and empirical literature dealing with labor market processes; wage determination and the impact of unions on relative wages; estimation of aggregate labor supply; resource allocation and labor mobility; the inflation-employment tradeoff and the economics of labor market discrimination.

5613 International Finance. Open economy macroeconomics and the role of devaluation, fiscal and monetary policy in the open economy, monetary approach to the balance of payments, portfolio balance and asset market approaches to the determination of exchange rates.

5623* Economic Development I. Characteristics and problems of less-developed countries. Criteria of growth and development with emphasis on strategy for development. The role of capital, labor, technological progress and entrepreneurship. Growth models.

5633* International Trade. International trade and commercial policy. Comparative advantage, general equilibrium and modern trade theories; welfare implications of international resource allocation models; the theory of protection and international interdependence.

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, performance; public policies affecting these elements.

5723 Industrial Organization II. Alternative market structures and their relationships to market performance; the empirical evidence concerning these. Public policies toward business, including emphasis on U.S. 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.

6000* 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. Monetary theory and 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.

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: junior standing and consent of instructor or Honors coordinator. Study of an 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 desire for 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 experiences. For the pre-service or in-service level.

4920 Teacher Education Practicum. 1-9 credits, maximum 15. 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. An aid to the classroom and learning theory approaches employed.

5110* Contemporary Educational Issues. 1-6 credits, maximum 6. 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. An aid to the classroom 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 society. Legal remedies and guidelines that combat discrimination by sex; sex-role stereotyping of men and women as reflected in education.

5910 Educational Field Experiences. 1-6 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.

6200 Seminars in Education. 2-6 credits, maximum 6. Prerequisite: consent of instructor. Limited to graduate students who have experience in the field and knowledge of graduate level techniques in research. Students pursue individual research problems under the direct supervision of members of the staff.

6203* Doctoral Seminar. Prerequisite: approval of adviser. Open to all doctoral aspirants dealing with preparation of a proposal for the doctoral study. Mechanics and techniques 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.

5720* Education Workshop. 1-4 credits, maximum 8. Analysis of organizational, administrative, and instructional problems by common schools and higher education personnel.

5920 Public School Administration. The scope and function of public school administration.

5933* Public School Finance. Prerequisite: graduate standing and consent of instructor. A detailed analysis of educational finance, taxation, distribution systems, policy analysis; application to Oklahoma school finance; and introduction to budget development.

5953* Educational Systems, Design and Analysis. Prerequisite: 5 credit hours of statistics. Current research literature in educational administration, both common and post-secondary education. Centralization and devolution, planning, organization and implementation of educational systems. Emphasis is placed on statistical and research skills to educational administration.

5940 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.

6233* Critical Issues In Higher Education. 1-3 credits, maximum 9. 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 and schedules.

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, administration, and evaluation. School accounting and other business management topics.

6353 The Supervintendency. Prerequisite: consent of instructor. Integration of theory and practice through examination of administrative responsibilities of the superintendent. Particular emphasis on leadership, communications, and the changing nature of public education.


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, laws, and court cases concerning higher education. Considerable legal research required.

6473 Practicum in Instructional Supervision. Prerequisite: 6263 or consent of instructor. Application of modern 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.

5673 School Facilities. Prerequisites: 5833 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 organizational behavior and behavior of personnel in organizations.

6613 Organizing, Developing and Administering Community 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.

6620 The School-Community Survey. 1-3 credits, maximum 6. Basic principles and assessment techniques applied in the field through needs and resource assessment, program planning, and facility evaluation and planning.

6650 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 in the college, and college faculty. 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, 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 instructional and/or administrative problems.

6730 Planning and Educational Change. 1-4 credits, maximum 4. Includes organizational and environmental parameters, sources of 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 treated.

6813 Academic Programs: Development and Implementation. Development and implementation of academic programs including curriculum for colleges and universities, investigation of teaching-learning relationships, and institutional emphasis.

6823 Educational Leadership. Prerequisite: 6803. Marshalling scarce resources to achieve institutional goals and objectives Congruent with the needs and abilities of persons associated with the institution. Research on leadership models and styles, with consideration given to application in higher education today. May also be of value to those in business and industry, politics, and government.

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 in higher education emphasizing an 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. Topical 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.

6910 Practicum. 1-5 credits, maximum 9. Required of all candidates for the Specialist in Education degree. Designed to help the student carry out an acceptable field study or research problem. Credit given upon completion of the written report.

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**Electrical and Computer Engineering (ECEN)**

2211 Digital Computing for Engineers. FORTRAN compiler language, philosophy of automatic computer programming and 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 3113 and in 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.

3113 Energy Conversion I. Lab 2. Prerequisite: 3613, concurrent enrollment in 3013, 3313. Physical principles of electromagnetic and electromechanical energy conversion devices and their application to conventional transformers and rotating machines. Network and phaser models; steady-state performance.

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: diodes and transistors, clamping and clamping circuits, power-supply filters and linear low-frequency amplifiers.

3413 Control Systems I. Prerequisites: ENGS 2122; ENGS 2613, MATH 2613; concurrent enrollment in 3613 and 3713. Laplace and z-transforms, solutions to differential and difference equations. Transfer functions and block diagram manipulation. Modeling of mechanical and electrical 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, 3713. Maxwell's equations and their application to engineering problems in electrostatics, magnetostatics, plane wave propagation, and transmission line theory. The last three to four weeks of the semester will include two hours of labs and demonstrations per week.

3713 Introduction to Network Analysis. 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. 1-2 credits, maximum 12. Prerequisite: consent of instruc-

4013 Senior Design Laboratory I. Lab 4. Prerequisites: 3013, 3313, 3413, and 3213 or 3223. The design cycle for several small projects, each including establishing objectives, selecting alternatives, conducting the computer simulation, and a final oral or written report.

4025 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.

4133 Power Electronics. Prerequisite: 3113. Power electronic devices, components, and their characteristics; DC/AC conversion; fundamentals of inverters and wavershaping devices; application aspects; control aspects; characteristics of 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 through mathematical modeling of the load flow model and the optimum economic generator allocation problem utilizing computer methods.

4213** Computer-based System Design. Lab 2. Prere-

4243** Computer Architecture. Prerequisites: 3213 and 3223. Organization and hardware design of digital computer systems. Review of logic circuits, integrated circuit functions 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. Prere-

4273 Software Engineering. Prerequisites: Lab 2. 3213 or COMS 3443; COMS 2133. Principles underlying software design methodology. Standards for software design. Design decisions. Survey of software design methodology. Solution of a large scale software design problem in a simulated working environment. Same course as COMS 4273.

4283 Computer Networks. Prerequisites: 3213 or COMS 3443; UNIX knowledge. Computer networks, distributed systems and their systematic design. Introduction to the use, structure, and architecture of computer networks. Networking experiments to describe network technology. ISO reference model. Same course as COMS 4283.

4303 Digital Electronics Circuit Design. Lab 2. Prerequisites: 3113, Theory of digital and electronics circuits. Digital logic families TTL, IIL, ECL, NMOS, CMOS, GaAs. Small scale implementation at RAM and ROM. Circuit design for LSI and VLSI.

4313** Linear Electronics Circuit Design. Prerequisite: 3131. The analysis, design, and implementation of linear electronic circuitry including feedback, symmetrical and differential operational amplifiers, utilizing field-effect transistors, bipolar tran-

4353 Communication Electronics. Prerequisite: 3213. Design of tuned voltage and power amplifiers, oscillators and mixers, modulation and detection, and parametric amplifiers.

4413 Controls II. Prerequisites: 3413, 3513, 3713. Design of analog and digital feedback control systems, review of fundamental control system theory and design, state space methods, and discrete-time systems, sampling, relationship between pole locations and time response, frequency domain performance, root locus method, and discrete-time compensation techniques, state variable feedback and pole positioning design.

4423 Nonlinear and Digital Control Systems. Lab 2. Prere-

4453 Communication Theory. Prerequisite: 3513, Noise in modulation systems. Digital data transmission. Design of optimal receivers. Introduction to information theory.

4453 Communication Theory. Prerequisite: 4503 or STAT 4533. Signal detection in noise. Tradeoffs between band-

4463 Microwave Engineering, Antennas and Propagation. Prerequisite: 3613. Engineering aspects of the transmis-

4473 Introduction to Network Synthesis. Prerequisite: 4703. Network functions and their realizability, driving-point synthesis, passive and active network synthesis.


5010 Thesis or Report. 1-6 credits. Maximum 6. Prerequisite: approval of major professor. A student studying for the master's degree will enroll in this course for a maximum of six edit hours.

5030 Professional Practice. 1-8 credits, maximum 8. Experience in application of electrical engineering principles to typical problems encountered in industry and government engineering design and development proj-

5050 Seminar. 1-12 credits, maximum 12. Prerequisite: con-

5103 Energy Conversion II. Prerequisite: 3113. Dynamic model of rotating electromechanical energy converters in terms of the generalized machine concept. Time-

5113 Power System Analysis by Computer Methods. Prerequisites: 3113, 3213, 3223 and 4213. Team projects involving 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.

5123 Engineering Systems Reliability Evaluation. Techni-

5153 Direct Energy Conversion II. Energy conversion techniques and applications; thermoelectrics, ther-

5203 Parallel Processing. Prerequisite: graduate standing. Computational methods for solving problems with parallel processing. Parallel architectures and interconnect structures. Programming techniques, including problem decomposition, vector and matrix algorithms. Monte Carlo methods, sorting, and simulation. Performance measures and performance evaluation. Applications to signal processing and image processing. Opportunity to explore concepts on a modern hyper-

5213 Microcomputer System Design. Prerequisites: 3213 and 3223. Design, construction, programming, debugging and documentation of microcomputers interfaced to general purpose devices. Electronics considerations for incorporating different families of IC's and discrete com-


5253** Digital Computer Design. Prerequisite: 4253. 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 algorithms, input/output interfaces. Same course as COMS 5253.

5293* Artificial Intelligence and Expert Systems. Fundamenta-
lar concepts: search-oriented problem solving, knowledge representation, logical inference, building an expert system, languages and software tools and machine structures. Applications to planning, computing, natural language processing, speech recognition and robotics. Development of a prototype expert system or literature search and report is required. (Offered with the consent of the instructor.)

5313* Solid-state Electronics I. An advanced study of elec-
tronic networks. Application of solid-state devices to the mecha-

5353 Advanced Power Electronics. Prerequisite: 4133. Characteristics of high power semiconductor devices and the application of such devices to power conditioning, inversion, and wave shaping at high power levels.

5363 CMOS Analog Integrated Circuit Design. Prerequisite: 4313. Advanced study of solid state CMOS linear integrated circuits. Topics include transistors, multipliers, D/A and A/D converters and Op Amp building blocks. Op Amp building blocks include, differentiator, integrator, current mirrors, gain, output and references. VLSI layout and circuit simulation using SPICE.


5523* Estimation Theory. Prerequisite: 5313. Optimal estima-
tion theory including linear and nonlinear estimation of discrete and continuous random functions. Wiener and Kalman filter theory included.

5533 Modern Communication Theory. Prerequisites: 5313 and 5523. Transmission of messages by a complex communication system, introduction to information theory. Trade-offs between bandwidth, signal-to-noise ratio, and the rate of information transfer. Example system designs include earth satellite, deep space and terrestrial communication systems and computer communication networks.

5543* Data Transportation and Protection. Data and its representation; finite field matrices, pseudorandom sequences; information protection; space division net-
works; synchronization; and channel and error control.

5613 Foundations of Electrodynamics I. Prerequisite: 3613. A rigorous treatment of Maxwell’s equations utilizing Coulomb’s law and postulates of special relativity; the invariance of Maxwell’s equations under Lorentz transfor-
mation; applications of the Maxwell equations to scalar and vector potential functions, solutions of the Laplace and Poisson equations, solutions of the homogeneous and inhomogeneous wave equations with applications to guided waves, radiation, and scattering.

5653* Application of Electromagnetic Theory I. Intermediate-level treatment of applications of classical electromagnetic theory to radiofrequency transformers, waveguides, refraction and scattering, surface waves, antennas, and radiation. Sufficient mathematical sophistication to equip the student for state-of-the-art research in the area.

5713* Introduction to System Theory. State-space techni-
cues of engineering systems analysis. Application of matrix methods to systems modeled by linear vector dif-
ferential or difference equations. Develops controllability and observability conditions and eigenvalue/eigenvector assignment procedures.

5723* Nonlinear Systems Analysis I. Prerequisite: 5713. Fail-
ures of linear system theory; stability of nonlinear systems; methods of perturbations, asymptotic, orbital and structural stability; subharmonic generation; generalized approaches to nonlinear systems analysis.

5733* Digital Processing of Speech Signals. Review of digital signal processing; digital models for the speech signal. Short-time Fourier analysis, linear predictive coding of speech and an introduction to man-machine communication by voice.

5763* Digital Signal Processing. Introduction to discrete lin-
ear systems; frequency-domain design of digital filters; quantization effects in digital filters; digital filter hardware, discrete Fourier transforms; high-speed convolution and correlation approaches to digital filtering; introduction to Walsh-Fourier type.


5813* Optical Engineering. Physical and physiological con-

5833 Fiber Optics. Wave propagation in a cylindrical dielec-
trie waveguide. Solution of ray equation for a step index and a graded-index fiber. Monomode fiber. Optical proper-
ties of fibers: dispersion, absorption, scattering, Band-
width considerations, laser sources; spectral purity modulation. Detection systems: scintillation counters, heterodyne detection systems. Noise sources, fre-
cency response.


6000* Research. 1-3 credits. Maximum 30. Prerequisite: con-
sent of major professor. Independent research for students continuing graduate study beyond the level of the M.S. degree.

6050 Special Topics. 1-9 credits, maximum 9. Prerequisite: con-
sent of instructor. Subjects to be selected by the graduate faculty in electrical engineering to cover state-of-the-art advances.

6123 Special Topics In Power Systems. Prerequisite: 5113. Selected recent current topics related to power system operation and planning.

6253* Advanced Topics in Computer Architecture. Prereq-
quisites: 5253 or COMSC 5253. Innovations in the architecture and organization of computers, with an emphasis on parallelism. Topics include pipeline, multithreaded, and reduction machines. Same course as COMSC 6253.

6263* Advanced VLSI Design and Applications. Prereq-
quisites: 5223. Advanced VLSI design concepts and system timing. Designing testable integrated circuits. Specialized parallel process-
ing architectures. Application examples.

6413* Digital Control Systems. Prerequisite: 5413. Study of the computer as a control element in complex processes. Basic sampling theory. Analog-to-digital and digital-to-
analog conversion of data. Analysis of analog-digital systems via Z-transform methods and difference equa-
tions in state-variable form. Stability criteria and design approaches for digital compensation. Simulation of digital control systems on the hybrid computer.

6450* Control Systems II. 1-3 credits, maximum 6. Prereq-
quisites: 5723. Advanced topics in optimal control systems. Dynamic programming and the maximum principle applied to stochastic systems. Optimum state estimation and the separation theorem. Selected topics from recent developments in adaptive and stochastic control.

6523 Introduction to Information Theory. Prerequisite: 5513. Mathematical theory of information (Shannon theory) including information measure and transmission rates and capacities. Source coding theory including algebraic and error-correcting codes. Design of waveforms for noise immunity. Information transfer in learn-
ing systems.

6550* Topics in Statistical Communication Theory. 1-3 credits, maximum 6. Prerequisite: 5513. Advanced topics chosen from recent developments, including learning and adaptive systems and typical adaptive estimation theory, decision theory applied to engineering problems, modulation and detection theory and analysis and process-
ing of seismic data.

6653* Applications of Electromagnetic Theory II. Applica-
tions of quantum electrodynamics. Topics of current interest with sufficient mathematical sophistication to equip the student for state-of-the-art research in the area.


6723* Nonlinear Systems Analysis II. Prerequisite: 5723 or Major 5523. Topics in nonlinear systems theory selected from the current literature. May include nonlinear stability theory, multi-input describing functions, nonlinear feed-
back control theory, the problem of Lure and Popov’s criterion, multivariable perturbation theory.

6813* Solid-state Techniques. Prerequisite: 5813. Device fabrica-
tion, wafer preparation, etching and masking techniques, alloying, bonding, testing, Epitaxial techni-
quies, special topics.

** ELECTRICAL POWER TECHNOLOGY (EPT) **

3103 Introduction to Electrical Power. Lab 3. Prerequisites: junior standing and trigonometry. Overview of the elec-
tricity systems and laboratory experience on the basic components of the power system. Technical language and symbology of the industry; surveying as applied to the needs of electrical power.

3213 Power Systems I. 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 con-
nections to power systems. Methods of starting and con-
 trolling electrical machines.

3224 Power Circuits and Machinery. Lab 3. Prerequisites: 3103 and balanced operation of poly-phase electric circuits, DC and AC machinery and power transformers. Laboratory includes connections, testing and terminal behavior of operating electric circuits, machines and transformers. Control of both DC and AC machinery.

4003 Nuclear Power. Lab 3. Sustained nuclear chain reac-
tions, reactor kinetics and shielding. Measurements of nuclear properties of fuels and moderators.

4050 Advanced Electrical Power Problems. 1-4 credits, maxi-
mum 4. Prerequisites: junior standing and consent of dept head. Special problems in the electrical power area.

4113 Power Systems II. Prerequisites: 3213, 3224, MATH 2383 and probability and distribution line parameters. System modeling load flow analysis. Mathematical techni-
quies in the analysis of large networks. Problem pro-
cedures are computer assisted.
4124 Switchgear and Protective Relaying. Lab 3. Prerequisite: 3213. Types of switchgear and protective devices discussed as to construction, use, testing, installation and maintenance.

4134 Control Circuits and Systems. Lab 3. Prerequisites: 3224 and basic electronics. Operational amplifiers, synchrons and digital concepts in control and analog to digital converters. Analysis techniques such as Laplace transforms and control systems modeling using both physical variables and block diagram techniques.

4223 Advanced Topics in Electrical Power. Prerequisites: 4113, 4124. Electric energy systems planning, operation control, and protection. System problem solutions are computer assisted.

4234 Solid State Power Electronics. Lab 3. Prerequisite: 4134. Solid state electronic devices such as thyristors, power switches, rectifiers and switched DC sources. AC voltage controllers, three-phase controllers and controlled rectifier circuits. Choppers, inverters, cycloconverters, cycloconverters, and uninterruptable power supplies will be studied.

**ELECTRONICS AND COMPUTER TECHNOLOGY (ECT)**


1112 (L) Electronic Devices and Programming. Lab 3. Prerequisite: 1104 or EPT 3103. Solid-state devices in electronic amplifiers and power supplies. Introduction to the BASIC programming language on a microcomputer.


1244 Circuit Analysis I. Lab 3. Prerequisites: 1104 and MATH 1715; Co-requisite: 1224. Transient analysis of electric circuits. The use of network theorems. Resonant circuits and filters and AC power including three-phase.

2113 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. Emphasis on acquiring a measurement and developing the control signal logic.

2544 Pulse and Digital Techniques. Lab 3. Prerequisites: 1224 and 1244. 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 microcomputers 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.

2733 Electronic Fabrication Techniques. Lab 3. Prerequisites: 2303 and 2634. Laboratory projects for modern electronic engineering technicians. Circuit test, development and fabrication in wired and printed form.


3113 Circuit Analysis II. Prerequisites: 2544, COMSC 2113 and MATH 2373. Application of elementary switching functions and Laplace transforms to electronic circuit analysis in the s-plane, transfer functions and computer applications.


3234 Nondestructive Testing. Lab 2. Commonly used nondestructive testing methods. Ultrasonic, Magnelux, liquid penetrant, ultrasonic and eddy current testing.

3263 Electronic Digital Systems. Lab 3. Prerequisite: 2633. Use of both minicomputers and microcomputers 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 electronics in amplifiers, bias stabilizing, stability of feedback amplifiers, DC amplifiers, differential amplifiers and operational amplifiers.

3363 Data Acquisition and Control. Lab 2. Prerequisite: 2633. Waveform analysis and the control of automatic test equipment through the IEEE 488 BUS. Transducers D/A and A/D converters, multiplexers, and sample/hold circuits included. Use of a microcomputer in controlling test equipment. Silicon-controlled rectifiers as power-control devices.

4050 Advanced Electronic Problems. 1-4 credits, maximum 4. Prerequisites: junior standing and consent of head of Department. Special problems in the electronic area.

4153 Data Communications. Lab 3. Prerequisites: 2633, 2634, and 3263. Data communications including multiplexing concepts, sampling techniques, encoding techniques. Telemetry, digitized voice, TTY, and bulk transmission systems.


4503 Microwave Techniques. Lab 3. Prerequisites: 2634, 3113. Communication principles and measurement techniques in the UHF and microwave spectrum, coaxial, waveguide, and dielectric waveguide transmission systems and signal transmission, modulation and detectors, oscillators and amplifiers, introduction to signal transmission and modulation methods.

4832 Senior Project. Lab 3. Prerequisite: 20 credit hours of upper division electronics courses or consent of instructor. Intended for the last semester, a synthesis of all pertinent skills and knowledge developed in the curriculum. Production of a useful or marketable electronics product designed through design, assembly, test and demonstration phases.

**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.

2030 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 advisor. 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 V/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 advisor. 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 credits. Adjustments from previous college situation needed to select a proper course of studies 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 advisor. Application of credit to meet degree requirements varies with level and department.

4060 Topics In Technology and Society. 1-3 credits, maximum 6. Problems of society relating to technology and added problems stemming from their solution. Minimal reliance on mathematics; for engineering and nonengineering students.
ENGINEERING SCIENCE (ENGSC)

2112 Statics. Lab 2. Prerequisites: PHYS 2114 and MATH 2265. Resultants of force systems, static equilibrium of rigid bodies and statics of structures. Shear and moment diagrams.

2122 Elementary Dynamics. Prerequisite: 2122. Dynamic equilibrium of particles and bodies. Work-energy and impulse momentum principles.

2142 Strength of Materials. Prerequisite: 2122. Bending moments, deformation and displacements in elastic and plastic deformable bodies.

2213 Thermodynamics. Prerequisites: CHEM 1515, PHYS 2114, MATH 2265. Properties of substances and principles governing changes in form of energy. First and second laws.

2613 Introduction to Electrical Science. Prerequisites: PHYS 2114 and MATH 2365. Elements of electrical engineering; AC and DC circuits, mesh and node formulation of network equations, steady-state response to sinusoids, energy, power and power factor.

3233 Fluid Mechanics and Heat Transfer. Prerequisite: MATH 2365 or concurrent enrollment and CHEM 1515. Fluid statics, laminar and turbulent momentum transfer and convective heat transfer at introductory level. Dimensional analysis. Flow analysis of real fluids with the Bernoulli equation. Conduction and radiation of heat; heat exchanger analysis.

3213 Materials Science. Prerequisite: CHEM 1515. Introduction to the role of structure and properties of materials and engineering applications. Atomic, microscopic and macroscopic properties.

ENGINEERING TECHNOLOGY

(See specific technology programs listed alphabetically)

ENGLISH (ENGL)

0003 Remedial Composition for International Graduate Students. Lab 2. Sentence structure, paragraphing, idiomatic usage, punctuation, vocabulary, pronunciation and documentation. Graded on pass-fail basis.

0123 Basic Composition. Intensive instruction in grammar and error avoidance (especially the differences between spoken and written English), paragraph structure, and essay writing. May be used for skills remediation or to satisfy high school curricular deficiency in English.

0103 Studies in English Composition. 1-2 credits, maximum 6. 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 or 1113. 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 of 25 and 3.50 overall high school or transfer GPA. 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: “A” or “B” in 1113 or 1313. English ACT score of 25 and consent of course director. Individually directed writing growing from discussions of books and ideas. Class size limited. This course may be substituted for 1213.

1923 (H)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. Development or 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.

244 (H,SpD)Languages of the World. A comprehensive survey of world languages. The essential structural and historical organization of languages. The processes of language as a basic human function. Same course as FLL 2443.

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.

2823 (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, traditions, 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. Emphasis on the study of non-Western literature available in English.

3200 Special Problems in Language and Literature. 1-3 credits, maximum 3. Prerequisite: 9 credit hours of English. Specialized readings and independent study.

3203 Advanced Composition and Rhetoric. Prerequisite: 9 hours of English. Theories of regulative grammar and rhetoric as applied to the writing process.

3223 Criticism. Study and application of principal critical theories in literature, film, or technical writing.

3232 Technical Writing. Prerequisites: 1113, 1323, and junior standing. Applied writing in areas of specialization. Intensive practice in professional writing modes, styles, research techniques and editing for specialized audiences and/or publications. This course may be substituted for 1233 with an “A” or “B” in 1113 and recommendation of student’s college.

3333 (H)Short Story. Origins, development, theory and craft of the short story.

3353 (H)Film as Literature. Film and literature as narrative forms.

3363 (H)Drama. Origins, development, theory and craft of drama.

3603 British Literature to 1600. Historical development. Major writers and their works.

3604 (H)British Literature 1600-1800. Historical development. Major writers and their works.


3653 British Literature Post 1900. Historical development. Major writers and their works.

3703 (H)American Literature to 1800. Historical development. Major writers and their works.

3713 (H)American Literature 1800-1900. Historical development. Major writers and their works.

3723 (H)American Literature Post 1900. Historical development. Major writers and their works.

4003 History of the English Language. Prerequisite: 9 credit hours of English. The growth of the English language.

4013 English Grammar. Prerequisite: 9 credit hours of English. The traditional terminology and concepts of English grammar leading or evolving into the several current systems of description.

4083 Descriptive Linguistics. Prerequisite: 9 credit hours of English. The methodology of linguistic analysis.

4083* Applied Linguistics. Prerequisite: 9 credit hours of English. The application of linguistic theory to literary analysis.

4093 Language in America. Historical development of American English. Regional, social and cultural language differences.
4263  Aesthetics of Film. Major theoretical approaches to the art of cinema: auteurism, semiotics, structuralism, historicism.

4303  British Drama 1500-1660. Genre development. Major writers and their works.

4313  British Drama 1660-1800. Genre development. Major writers and their works.

4403  American Poetry to 1900. Genre development. Major writers and their works.


4453  Contemporary Literature. Genre development. Major writers in the novel, poetry, or drama and their works.

4523  Technical Writing Internship. Prerequisite: 6 credit hours of English including 3323. Practice in writing resumes, proposals, abstracts and articles. Concentrated review of mechanics, proofreading, editing and interviewing techniques. Second eight weeks will include internship experience.

4533  Advanced Technical Writing. Prerequisite: 6 credit hours of English including 3323. Specialized writing projects growing out of areas of specialization with emphasis on practical and marketable skills.

4543* Technical Editing. Prerequisite: 9 credit hours of English. Scientific and technical editing skills; emphasis on editing project.

4550  Problems in Technical Writing. 1-3 credits, maximum 6. Prerequisite: 12 credit hours of English. Specialized readings and independent studies.

4523* Technical Writing Internship. Prerequisite: 6 credit hours of English including 3323. Practice in writing resumes, proposals, abstracts and articles. Concentrated review of mechanics, proofreading, editing and interviewing techniques. Second eight weeks will include internship experience.

4533  Advanced Technical Writing. Prerequisite: 6 credit hours of English including 3323. Specialized writing projects growing out of areas of specialization with emphasis on practical and marketable skills.

4543* Technical Editing. Prerequisite: 9 credit hours of English. Scientific and technical editing skills; emphasis on editing project.

4550  Problems in Technical Writing. 1-3 credits, maximum 6. Prerequisite: 12 credit hours of English. Research methods, emphasis on research project.

4563  Scientific and Technical Literature. Prerequisite: 6 credit hours of English. Scientific and technical style.

4563* Advanced Fiction Writing. Prerequisite: 3033. Student practice and composition.

4643  Advanced Poetry Writing. Prerequisite: 3043. Student practice and composition.

4653  Advanced Scriptwriting. Prerequisite: 3053. Student practice and composition.

4703  (H)Chaucer. The Canterbury Tales in Middle English.

4713  (H)Million. The more notable minor poems, prose selections and the major poems-Paradise Lost, Paradise Regained and Samson Agonistes-studied critically in context of the 17th Century.

4723  (H)Shakespeare. Major plays and selected criticism.

4730* Single Author or Work. 3 credits, maximum 6. The works of a single author such as Hawthorne, Coleridge, or Faulkner or a single work and selected criticism such as The Bible, The Prelude, Moby Dick, Ulysses.

4773  Literature by Women. The collection of literature written by women in England and America, classical and modern figures.


4933* Minority, Ethnic or Regional Literature. The study of minority, ethnic or regional American literature. Topic varies by semester.

4993  Senior Honors Thesis. Prerequisites: admission to A&S Honors program and 3.50 cumulative GPA. For Honors students in their final semester. Thesis written on a topic of students choice and directed by a faculty member. Final approval of thesis requires oral defense.


5013  Introduction to Graduate Studies. Principles and procedures in scholarly research.

5023  Old English. Major works in Old English.

5053* Single Author or Work. The works of a single author such as Spenser, Shakespeare, Pope, or Nabokov or a single work and selected criticism such as Hameit, Huckleberry Finn, or Pound’s Cantos.

5063* Seminar in Shakespeare. Intensive study of a limited number of plays. Assignment of problems to individual students.

5073* Old English Poetry. Prerequisite: 5023. Beowulf in Old English and selected criticism.

5083  Seminar in Chaucer. The Canterbury Tales in Middle English; language study, criticism.

5093* Seminar in Milton. Poetry, major prose, and criticism.

5120  Studies in Teaching English as a Second Language. 1-3 credits. 6. Selected topics in teaching English as a second language; e.g. cross-cultural communication, material preparation, bilingual education.

5130* Seminar in English Grammar. 3 credits, maximum 6. Selected study of current topics in grammatical theory as it applies to the teaching of English.

5140* Seminar in Linguistics. 3 credits, maximum 6. Selective study of current topics in linguistics.

5163* Middle English Literature. Major works in Middle English.

5210  Seminar or Directed Study. 1-6 credits, maximum 9. Specialized readings or independent studies.

5213* Teaching Freshman Composition. Materials and methods of instruction in freshman composition.


5243  Teaching English as a Second Language. Theories of second language acquisition. Materials and methods of instruction.

5293  Interdisciplinary Uses of English. Interdisciplinary study with emphasis on multiple uses of literature and writing: for example film, new media, popular culture, American studies.

5313* Internship, Teaching English as a Second Language. Supervised teaching of beginning through advanced English as a second language courses.

5333  Seminar in TESL: Testing. Standardized testing for teaching English as a second language.

5410* Seminar in British Literature of the 16th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 16th century.

5420* Seminar in British Literature of the 17th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 17th century.

5440* Seminar in British Literature of the 18th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 18th century.

5460* Seminar in British Literature of the 19th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 19th century.

5480* Seminar in British Literature of the 20th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 20th century.

5520* 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.

5533* 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.

5543 Seminar in Scientific and Technical Editing. Managing technical documentation production; developing scientific and technical editing skills; special emphasis on editing project.

5630* Seminar in Early American Literature. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 17th and 18th centuries.

5660* Seminar in American Literature of the 19th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 19th century.

5660 Seminar in American Literature of the 20th Century. 3 credits, maximum 6. Selected writers and their works, themes and literary developments of the 20th century.

5733 Seminar in Creative Writing: Fiction. Writing fiction at the professional level.

5743 Seminar in Creative Writing: Poetry. Writing poetry at the professional level.

5753 Seminar in Creative Writing: Scriptwriting. Scriptwriting at the professional level.

5990 Special Problems. 1-3 credits, maximum 6. Investigation into a designated area of English leading to materials suitable for creative component option (M.A.).


6133* Studies in Creative Writing: Action. Prerequisite: 5753. Individual projects in fiction.

6143 Studies in Creative Writing: Poetry. Prerequisite: 5743. Individual projects in poetry.

6153 Studies in Creative Writing: Scriptwriting. Prerequisite: 5753. Individual projects in scriptwriting.
ENTOMOLOGY (ENTO)

2003

Insects and Man. Insect development, behavior, ecology, and the relationship of insects to man.

3003

Livestock Entomology. Lab 2. Economic importance, biology and control of pests affecting domestic animals.

3021

Insect Pests of Stored Products. Lab 4. The biology, damage and control of insect pests of stored products.

3022

(A)Apiculture. Biology of the honeybee and other bees.

3333

Insect Pests of Agronomic Crops. Lab 2. Life histories, and behavior of insects with emphasis on ecology and control of pests in field crops.

3423


3463

(N)Forest Insects. Lab 2. The biology and control of insects injurious to shade tree, forest and forest products.

3554


3880


4123

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.

4223


4523

Principles of Insect Pest Management. Lab 2. Prerequisite: 3112 or 3332 or 3553. Modern concepts of pest regulation and the influence of alternatives on the agroecosystem 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.

4913

Pesticides in the Environment. Prerequisites: BISC 1403, CHEM 1225. A discussion of pesticides (chiefly fungicides, insecticides, herbicides and nematicides), including potential movement, degradation, fate and significance in the environment.

5000


5002

Insect Biochemistry. Prerequisites: BIOCH 3653. Biochemical processes in insects with emphasis on how biochemical pathways are used by the insect to adapt to its environment.

5020

Special Problems. 1-8 credits, maximum 8. Prerequisite: graduate standing. Selected studies in the area of entomology, acarology or araneology.

5043

Insect Physiology. Prerequisites: course in organic chemistry and 9 credit hours biology. Functions of the organ systems of insects. Lecture-demonstrations of selected insect physiology techniques.

5224

Classification and Biology of Immature Insects. Lab 6. Prerequisite: 3554. Classification, collection, preservation and biology of immature insects.

5330

Advanced Systematic Entomology. 1-5 credits, maximum 5. Prerequisite: 5464. Special problems in advanced systematic entomology.

5332

Literature of Zoological Science. Prerequisite: BISC 1802 or equivalent.Mechanics of the library, use and preparation of bibliographies, preparation of a scientific paper, taxonomic indices and literature.

5464

Systematic Entomology. Lab 4. Prerequisite: 3553 or equivalent. Classification and comparative biology of terrestrial insects.

5512

Biological Control. Prerequisite: 4523. Principles and practices of insect control with inimical organisms.

5550

Advanced Agronomic Entomology. 1-5 credits, maximum 5. Prerequisite: 4523. Special problems in advanced agronomic entomology.

5612

Host Plant Resistance to Insects. Prerequisite: AGRON 3553. Insect population management by host plant resistance.

5644

Insect Morphology. Prerequisite: 3553. Insect development and comparative morphology.

5660

Readings In Integrated Pest Management. 1-2 credits, maximum 2. Prerequisite: 4523 or equivalent. Reading and discussion of current publications relating to biological and economic theories that form the basis for integrated pest management (IPM) programs.

5710

Advanced Medical and Veterinary Entomology. 1-5 credits, maximum 5. Prerequisite: 4564. Special problems in methods of disease transmission, animal parasite control and the relationships existing between parasite and host.

5733


5750

Insecticide Toxicology. Prerequisite: organic chemistry or 15 credit hours biology. Properties and mode of action of the major insecticidal materials. Assessment of their impact on the environment.

5850

Epidemiology of Arthropod borne Diseases. 1-4 credits, maximum 4. Lab to be arranged. Prerequisite: 4854 or equivalent. The relationships existing between the hosts, arthropod vectors and causal agents of disease and the principles of disease prevention or suppression by the intelligent use of biological principles.

6370

Seminar. 1 credit, maximum 5. Prerequisite: consent of instructor. Written and oral reports and discussion of recent developments in entomology.

6500

Doctoral Research and Dissertation. 1-10 credits, maximum 30. Prerequisite: M.S. in entomology or permission of major professor. Independent investigation under the direction and supervision of a major professor.

6600

Advanced Insect Physiology. 1-5 credits, maximum 5. Prerequisite: 4043. Special problems in advanced insect physiology.

ENVIRONMENTAL SCIENCE (ENVIR)

5000

Research for Thesis or Report. 1-6 credits, maximum 6. Prerequisites: approval of advisory committee and departmental steering committee. Research leading to master's thesis or report.

5100

Environmental Problem Analysis. 3 credits, maximum 6. 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 or reports.

6000

Research for Dissertation. 1-12 credits, maximum 24. Prerequisites: approval of advisory committee and departmental steering committee. Research leading to the Ph.D. dissertation.

6200

Seminar In Environmental Problems. 3 credits, maximum 6. Multidisciplinary investigations of a current environmental problem that may be either global or local in nature.

FAMILY RELATIONS AND CHILD DEVELOPMENT (FRCD)

2003

(S) Dynamics of Family Relationships. An ecological approach to interpersonal relationships through study of the processes in the family that influence the way members relate to each other throughout their lives. Practice in application of principles is included.

2113

(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.

2213

(S) Human Sexuality and the Family. Sexual development emphasizing personal adjustment and interaction with 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 Early-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 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 Social and Emotional Development in Early Childhood. The social and emotional 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.

3253 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 Development of Creative Expression and Play in Early Childhood. 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 relationships. Observation of adolescents.

3403 Language Development, Literacy and Literate in Early Childhood. Prerequisite: 3213 or equivalent. Consideration of appropriate experiences in the areas of language and literature arts. Experiences with nursery school, kindergarten and other children's groups.

3503 Cognitive Development in Early Childhood. 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.

3625 Fundamentals for the Helping Professional. Prerequisite: 3613. Development of fundamental skills and techniques used by those in helping professions as viewed from the systems theory perspective. Observation and interviewing techniques, problem-solving and advocacy skills, and introduction to grant writing.

3752 Family Development. Relationships over the life course within the American family. Variations in form and function of the family system related to cultural, historical, economic, and social contexts.

3810 Practicum or Internship in FRCD. 1-9 credits, maximum 9. Prerequisites: 3213 and 3233, or 3613 and 3625, or consent of instructor. 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.

4133 Organizing and Administering Programs for Families 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. Historical foundations and methods of early childhood curriculum models, including multicultural and nonsexist approaches, and current major issues in early childhood education.

4420 Preschool Teaching. 1-7 credits, maximum 7. Lab 3-21. Prerequisites: 3213, 3303, 3403, 3503, full admission to Teacher Education Program, and pre-registration with director of Child Development Lab. Preschool teaching, with responsibility in nursery-school-kindergarten groups.


4533 Adulthood: Middle Years. Study of the unique characteristics of middle age, middle years 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. Interrelation between physical, psychological and social development in later years.

4673 Theories and Issues in Family Relationships. Prerequisite: 3753. Introduction to family theories. Current research and issues related to family dynamics, relationships, and crises within the context of the family system.

4743 (L) Introduction to Research Methodology In Family Relations and Child Development. Understanding research processes and procedures. Emphasis on the role of research in the development of knowledge to be consumers of scientific literature in FRCD. Includes practice in reading research and statistics, introduction to computers 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: HEECS 4113 or concurrent enrollment. Pre-employment seminar. Individual competencies related to family services, career options, and the process of seeking employment.

4850 Special Unit Courses In Family Relations, Child Development and Early Childhood Education. 1-6 credits, maximum 6. Various units taught by specialists in the field.

5000 Masters Thesis. 1-6 credits, maximum 6. Research in FRCD for M.S. degree.

5030 Teaching Human Development and Family Life. 1-3 credits, maximum 3. Prerequisite: 3753 or 4673. Content and teaching aids in teaching family relationships, family life, child development and human development.

5110 Research Developments in FRCD. 1-3 credits, maximum 3. Prerequisite: concurrent enrollment in HEC 5102. Current developments and needs in research in FRCD including application of research methods to FRCD and research planning.

5122 Computer Applications and Analysis In FRCD Research. Creating variable codebooks, coding data for research, using inputting data for computer analysis using the SPSS-X package. No computer experience necessary.

5140 Methods of Teaching Child Development and Guidance. 1-3 credits, maximum 5. Prerequisites: 2113 and 3213, or equivalent. Observation and participation in programs for children, youth and adults. Supervision by FRCD faculty members or their designated representatives.

5213 Child Behavior and Development. Consideration of theory and significant areas of research that contribute to the understanding of child behavior and development.

5223 Adolescent Development. The processes of development occurring during the adolescent period of life. Physical, social, emotional and intellectual development. Exploration of research and theoretical explorations related to adolescence and youth.

5243 Family Crises and Resources. Crises and special problems encountered in family living; individual and community resources pertinent to them.

5253 Early Childhood Education: Curriculum. Implications of child development theory and research for planning educational programs and learning experiences appropriate for young children.

5263 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 Marital and Premarital Enrichment Education. Analysis of varieties of couple relationships and educational needs that enhance spousal 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. 1-9 credits, maximum 7. Lab 1-21. Prerequisites: courses in child development and early childhood education; and 3213, 3233, 3303, 3340, 3353, 3360. 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 major problems related to illness, death and divorce. Focus on dealing with these from a family systems approach.

5553 Diagnostic Assessment In Marriage and Family Therapy. Prerequisites: 5593; admission to FRCD-ABSED marriage and family therapy option; or consent of instructor. Diagnostic assessment in the assessment of family systems, the array of diagnostic tools available, and measurement theory to enhance the probability of meeting the therapeutic needs of troubled couples and families.

5590 Practicum In FRCD. 1-12 credits, maximum 12. Prerequisite: 5593, ABSED 5562. Supervised experience in various settings relevant in FRCD. May include work in the Child Development Laboratory, the Family and Child 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.

5623 Research Literature In Gerontology. Current research knowledge related to gerontology and the aging process. Critical study of classic and current research.

5632 Federal, State and Local Programs for the Elderly. A study of the Older Americans Act which mandates program services for the elderly, those services available and how they are coordinated.


5880 Early Childhood Education: Administration. 2-3 credits, maximum 3. Administration of programs for young children including consideration of information base for decision-making, aspects of effective organization and evaluation of policies and procedures.


5983 Theories of Child Behavior and Development. Prerequisite: 6 credit hours at graduate level in family relationships. Theoretical organizations and current conceptual frameworks 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.

5110 Research Problems In Family Relations and Child Development. 1-6 credits. Prerequisite: 6 credit hours. Research in special attention given to recent research literature and current theory.

5350 Seminar In Family Studies. 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.

5733 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 appropriate to the areas of family relations and child development.

5810 Advanced Problems In Family and Child Studies. 1-9 credits, maximum 9. Individual or group study of a significant aspect of family and child studies.

5983 Analysis and Application of Child Development Theory. Prerequisite: 5983. Critical analysis of selected child development theories using primary source material and demonstration of application to development, research and practice.

5993 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 individual's financial affairs. Budgeting, use of credit, mortgage financing, investment and estate planning.

3113 Finance. Prerequisites: ACCTG 2203, ECON 2023, STAT 2023. Operational and strategic financial problems including 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.

3650 Life and Group Insurance. Prerequisite: 3613. Principles of insurance applied to life and human values. Claims 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, financial leverage and financial planning, the institutional structure of mortgage lending, managing risks, investment strategies and decisions.


4213 International Financial Management. Prerequisite: 3113. Financial problems of multinational corporations. Developing a 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.

4813 Portfolio Management. Prerequisite: 3113. Overview of portfolio management from the point of view of a trust officer, mutual fund manager, pension fund manager, or other manager of securities. Emphasizes the need of financial managers for an understanding of problems, techniques, and theory of portfolio management.

5123* Investment Theory and Strategy. Prerequisite: 5353. Selected investment topics and advanced portfolio management techniques.

5213* International Business Finance. Prerequisite: 5353. Theories and financial management practices unique to business firms which operate in, or are influenced by, an increasingly global economy.

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.

5613 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 3. 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.” Physical, chemical and electrical hazards and their relationship to loss of property and 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.


1684 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: GENT 1113. Building construction standards and codes to assure maximum life and property safety. Fundamental concepts of 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 maximum effectiveness from a fire protection organization.
Lab 3. Prerequisites: 1373 and MATH 1513. Analysis.


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.


3113 Advanced Extinguishing Systems Design and Analysis. Prerequisites: 2483, 2243. Automatic fixed fire extinguishing systems and water supply systems. Emphasis upon computer assistance through use of existing design programs.

3202 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.

3244 Elements of Industrial Hygiene. Lab 3. Prerequisites: CHEM 1225 and junior standing. Toxic or irritating substances, physical, biological, ergonomic and other occupational stress factors causing employee illness or discomfort. Environmental pollution sources and controls.

3713 Hydraulic Design of Automatic Sprinkler Systems. Prerequisites: 1373, 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 (Independent Study). Lab 3. Prerequisite: CHEM 1515 and PHYS 1114. Description, operation and application of quantitative instruments in general use in industrial hygiene.

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 components in safety and health program compliance relating to hazardous materials incidents or waste sites. Regulatory control activities, transport-related inspections, incident modeling, 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. Nutrient 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 4. Selection, preparation and management of food service.

2123 Fundamentals of Dining Room Management. Lab 3. Prerequisite: 2113. Experience in organization and management of table service and beverage service in varied food service settings. Same course as HRAD 2123.

3133 (L) Science of Food Preparation. Prerequisites: 2113 or HRAD 1111, organic chemistry. Application of scientific principles to food preparation. Same course as HRAD 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 HRAD 3213.

3440 Food, Nutrition and Institution Administration. Prerequisites: 2463, 2243. Supervised work experience in one or more of the following: college and university food service, health care facilities, and food processing plants.

3473amon 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.

3553 Purchasing In Hospitality and Food Service Systems. Lab 2. Prerequisite: 3133 or concurrent enrollment. Procurement of food and nonfood commodities in hospitality and related industries. Same as HRAD 3553.

3652 Food Conservation and Preservation. Lab 3. Prerequisite: 3133, organic chemistry, microbiology. Modern methods and principles of food conservation and preservation including freezing techniques; laboratory experience with different methods.

3655 Dietetics as a Profession. Identification of changing roles, appropriate 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: 3133 or consent of instructor. Involves food science advertising, sensory evaluation and metabolic studies. Development of an individual research project.

4223* Nutrition In the Life Cycle. Prerequisites: 1113 or equivalent. Nutritional needs and dietary concerns of individuals from conception through old age.

4323* Human Nutrition and Metabolism. Prerequisites: 1113 (or equivalent), organic chemistry, physiology. Digestion, absorption and metabolism of nutrients; functions and health implications in the human organism.

4333 Food, Beverage and Labor Cost Controls. Prerequisites: ACC GT 2203, junior standing or consent of instructor. Basics of food and labor cost control systems associated with hospitality industry operations. Same course as HRAD 4333.

4363 Quantity Food Production Management. Lab 4. Prerequisites: 2123, 3133, 3553, 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.

4373 Creative Teaching of Nutrition. Prerequisite: 1113 or equivalent. Analyses of various methods, techniques, resources and evaluation for nutrition education. Experiential component required.

4573 Institution Organization and Management. Lab 3. Prerequisites: FNIA or HRAD 3553, 4363. 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: upperdivision standing. Reading and reporting on various topics in food and nutrition. Emphasis on interpreting journal articles and research results. Open to all upperdivision 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. 1-3 credits, maximum 6. Special units of study in this Department.

4852 Clinical Nutrition Practicum. Lab 3. Prerequisites: 4323; concurrent enrollment in 4853. Applications of clinical dietetics in the health care and community setting.

4853* Nutrition In Disease. Prerequisites: 4323; concurrent enrollment in 4852; one course in biochemistry. Physiological and metabolic bases for dietary modifications in disease states. Interpretation of laboratory data as it applies to nutritional care.

5000 Research In Food, Nutrition and Institution Administration. 1-6 credits, maximum 6. Prerequisite: approval of adviser. Individual research and thesis work 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.

5110 Research Developments In Food, Nutrition and Institution Administration. 1-3 credits, maximum 3. Prerequisite: concurrent enrollment in HEC 5102. Current developments and needs in research in FNIA including Food, beverage and labor cost control systems. Course includes development of research methods to FNIA and research planning.

5113 Investigational Cookery. Prerequisite: 4013. Food science, food quality and physical characteristics of food.

5230 New Findings in Nutrition. 1-3 credits, maximum 6. Prerequisite: 1113. Current emphasis in nutrition, with implications for nutrition research, education, and public service.
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, Greek, Hebrew, Latin, Russian, and Spanish. These languages are listed in alphabetical order by prefix.

1000 (I) Special Studies in Foreign Languages and Literatures. 1-10 credits, maximum 10. Special studies in areas not regularly offered; basic level.

2000 (I) Special Study in Foreign Languages and Literatures: Intermediate. 1-5 credits, maximum 10. Prerequisite: 10 hours or equivalent in target language (applies only to language course). Special study in areas other than those offered in regular program; intermediate level.

2103 (H) Masterworks of Western Culture: Ancient and Medieval. Ideas and values of Western culture as revealed through literary, artistic, historical, and philosophical contexts from Greek, Roman, and Medieval periods.

2203 (H) Masterworks of Western Culture: Modern. Ideas and values of Western culture as revealed through literary, artistic, historical, and philosophical contexts from the Renaissance to the Modern period.

2443 (H) Specialized Studies in a Modern Foreign Language. 1-3 credits, maximum 20. Lab 1-5. Prerequisite: consent of instructor. Instruction and/or tutorial work in a modern foreign language other than those offered in a major program.

5870 Problems in Food, Nutrition or Institution Administration. 1-4 credits, maximum 9. Newer problems and methods in food, nutrition or institution 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 Issues in Nutrition. Prerequisite: 5463 or consent of instructor. Current issues in human nutrition with emphasis on interrelationships of nutrients in metabolism and their impact on health.

6123 Micronutrients in Human Nutrition. Prerequisite: 5463 or consent of instructor. In depth study of vitamins and minerals and their interrelationships in metabolism.

6223 Current Issues in Food Service Administration. Prerequisites: 5343, 5593 or consent of instructor. Current issues in food service administration with emphasis on food service and sanitation, marketing, computer application, robotics and research needs.

6670 Independent Study in Food, Nutrition and Institution Administration. 1-3 credits, maximum 8. Selected areas of study in human nutrition or food service systems management for advanced graduate students working toward a doctorate degree.

6960 Seminar in Food, Nutrition and Institution Administration. 1 credit, maximum 3. Oral presentations of research papers and group discussions of current literature and findings in food, nutrition and institution administration. Doctoral level.

FOREST, FIRE MANAGEMENT, AND WILDLIFE

3503 (H) Asian Humanities: China and Japan. The many-faceted cultures of China and Japan from the first exploration in poetry and philosophy through popular stories, plays and novels of later times, with continuing attention to music and art.

4000 Specialized Studies in Foreign Languages and Literatures. 1-9 credits, maximum 9. Lab 1-9. Prerequisite: junior standing or consent of instructor. Individual guided study, tutorial or seminar on specially selected topics in a foreign language or literature.

4993 Senior Honors Thesis. Prerequisite: departmental invitation, senior standing. Honors program participation.

A guided reading and research program ending with an honors thesis under the direction of a senior faculty member with second faculty reader, both of whom will be present at an oral defense of the thesis. Required for graduation with departmental honors in any foreign language major.

5210 Graduate Studies in Foreign Languages. 1-6 credits, maximum 20. Prerequisite: 15 upper-division hours in the language. Graduate studies in foreign languages.

FOREST (FOR)


2134 Dendrology. Lab 4. Prerequisite: BISC 1403. Identification of trees and shrubs of the United States; their environmental requirements and utilization.

2773 Timber Harvesting. Timber harvesting systems, methods, 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. Field study of forest ecosystems, forest products, associated forest measurement and applied management of site productivity and stand dynamics; examination of current silviculture practices in major forest regions of the United States.

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 measurements of forests, forest products, standards, tree growth, and the application of mensurational techniques to timber valuation 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.

3022 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 tracing 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, intermediate cultural treatments, and silvicultural systems applicable in various forest cover types.

3333 Fire Management. An introduction to the unique role of fire in the forest 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 variability, their measurement, identification of natural populations, variation patterns, genetic improvement systems, and forest tree improvement methods as part of forest and nursery management systems.


3643 (N)Forest Environment and Related Resources. The interrelationships and uses of the soil, water, wildlife, 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.

3883 Aerial Photogrammetry and Information Systems. Lab 3. Prerequisite: MATH 1613. Use of aerial photographs in natural renewable resources and the application of geometrical relations to management systems. Study of scale, parallax, planimetric mapping, photo interpretation, and exposure to principles of computer-aided forest information systems.

3993 Forest Economics and Finance. Prerequisite: 3001, 3004, 3011, 3663 and AGEC 1114. Economic factors and analytical methods influencing decisions in forest resource management; factors affecting the production of wood products; arithmetic of interest and investment criteria; economics of nonmarket goods.

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 management objectives. Land and timber appraisals. 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. Prerequisite: 4223 and COMS 2113. Applications of mathematical and statistical models in solving 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.

4553 Forest Recreation. Prerequisite: senior standing. Forest recreation and the agencies involved in administering such areas; their policies and management programs and their impact on the recreation resource. Emphasis on the public sector but the private sector also covered.

4563 Tree Physiology. Prerequisites: 3413 and 3545. The physiological processes in trees; application of physiological principles in predicting the effects of silvicultural practices on tree growth response.

4601 Contemporary Issues In Forest Policy. Prerequisite: senior standing. Current issues in forest policy, public land allocation and use, alternatives for nonindustrial private forest lands, current legislation pertaining to forest resources, etc. A reading/discussion format is scheduled in the evenings at participants' homes. Enrollment limited.

4613 Forest Biometry. 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: 4813. Previous or concurrent. Techniques to evaluate the hydrologic processes and characteristics of forest and other wildland watersheds; precipitation, runoff, infiltration, erosion processes. Water quality assessment in woodland 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: 3443 and AGRON 2124, STAT 5013 or equivalent. Integrated study of the ecological, and genetic factors controlling the productivity of forest stands. Analysis of natural 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 integrated forest.

5143 Economics of Multiple Use of Forests. Prerequisite: 3993. Application of capital theory, production economics, welfare and conservation criteria and related developments in theory and analytical models to decision-making in the management of public and private forests for combination of timber, water, wildlife, range, recreation and other environmental values.

5753 Forest Genetics. Prerequisites: 3443 and ANSI 3423 or AGRON 3535. Patterns in forest tree populations; 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.

5762 Forest Tree Breeding. Prerequisite: 3443. The application of all cultural and genetic principles to the commercial production of genetically improved forest trees.

5813 Land Use and Water Quality. Prerequisites: a basic understanding of transportation, general chemistry. Nonpoint source pollution; relationships between land use and water quality; an emphasis on forestry, mined land, agriculture, and urban land uses. Focus on current research.

FRENCH (FRNCH)

1115 (1)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 (1)Elementary French II. Lab 1 1/2. Prerequisite: 1115 or equivalent. Continuation of 1115.

2113 (H, I)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, I)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, I)Intermediate French II. Lab 1. Prerequisite: 2113 or equivalent competence. (May have been gained in high school.) Continuation of 2113. May be taken concurrently with other 2000-level French courses.

2223 (H, I)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 literary. 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. 20 hours of French oral and written colloquial dialogue 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 3213.

3213 (H, I)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 French 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 a variety of literary genres, with presentation of French vocation and literary terminology.

3902 (H, I)Orientation to Internship Abroad. Prerequisites: 12 credit hours of French or equivalent proficiency. Preparatory course for summer practicum in French-speaking country.

3903 (H, I)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 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.
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. Identifications 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 protecting 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 engineering principles and concepts from the disciplines covered in earlier course work. 

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 consist of engineering experience on-campus or off-campus or both. Periodic reports both oral and written required as specified by the adviser.

5110 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.

6110 Advanced Study. 1-12 credits, maximum 12. Prerequisite: approval of the student's advisory committee. 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.

GENETICS (GENE)

3113 Principles of Supervision. Prerequisite: junior standing. A study of the fundamental principles of organizing, planning, staffing, controlling and directing as applied to first-line supervisory roles in industry.

3114 Principles of Genetics. Prerequisites: BIOC 2653 or BISC 3014 and one course in genetics or consent of instructor. An introduction to molecular genetics on the graduate level.

GENERATION TECHNOLOGY (GENTECH)

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.


1320 Technological Problems. 1-4 credits, maximum 6. Prerequisite: consent of instructor and adviser. Problems in applied 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 silence that are of particular interest to the engineering technician.

2323 Statics. Prerequisites: MATH 1613 and PHYS 1114. Force acting on bodies at rest; forces, moments of force, distributed forces, reactions, free-body diagrams, friction, internal forces and moments of inertia. Applications.

2650 Technical Projects. 1-4 credits, maximum 4. Prerequisite: consent of instructor. Development of work in a technical institute curriculum. Special projects assigned by advisers with the approval of the director. A comprehensive written report must be prepared and an oral examination may also be required.

2772 Motion and Time Study. Lab 3. Prerequisite: sophomore standing. Developing procedures for effective utilization of effort in industrial operations; analyzing job situations with stop watch, motion picture camera and other motion economy equipment.

2812 Statistics. Fundamental statistical measures, elementary probability, histograms, cumulative curves, linear correlation and regression, analysis of variance, estimation and significance tests.

GEOPHYSICS (GEOG)

1113 (S,Sp)Introduction to Geographic Behavior. The major organizing concepts of economic and cultural geography. Man's geographic behavior in terms of his spatial organization of the earth's surface and his development of regional and political systems.


2113 Field Observation and Mapping. Lab 2. Collecting and compiling data for weather, climate, land-use, social, economic, land-capability and cadastral maps.

2253 (S)World Regional Geography. The world's major culture regions, with emphasis on geographic aspects of contemporary economic, social and political relationships with the physical environment.

3003 Geographic Instructional Applications. Prerequisites: 1113, 1114 or 2253 or concurrent enrollment. Techniques and strategies for teaching basic geographic concepts and skills.

3023 (N)Climatology. Characteristics and distribution of world's climate, climate change as well as to steady states.

3123 (S)Urban Geography. Locational aspects of urbanization; functions of and relations among cities and between cities and rural areas; internal structure of urban areas.

3163 (S)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 corrective methods 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)Geography of Africa. General patterns of population and cultural heritage in Africa; focus on elements and patterns that contrast with Western civilization.

3513 (S)Political 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 analysis and research 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 involving 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. Prerequisite: 3523 or 3533. An introduction to methods of examining and analyzing physical and human dimensions of regions.

3653 (S)Geography of Oklahoma. Geographic interpretation of physical, economic, historical and scenic features.

3723 (L)Geography of Western Europe. Location and analysis of natural, economic and cultural features of Western Europe.

3733 (L)Geography of East Europe and USSR. A regional analysis encompassing cultural, economic and physical features.

3743 (L)Geography of Latin America. Areal distribution and analysis of physical, cultural and economic features of Middle and South America.

3753 (L)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.

4013 Undergraduate Cooperative Education Internship. 1-9 credits, maximum 9. Prerequisites: consent of departmental adviser and consent of instructor. Practical experience, stressing geographical concepts to societal problems. Students work with both agency representatives and faculty members.

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: 2263 or 3163. Emphasis on international flows of goods and services resulting from differences in comparative economic advantages. International trade and aid 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)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 computer.

4333 (L)Remote Sensing. Lab 2. Prerequisite: 3523 or FOR 3882 or GEOG 3202 or 5153. Use of several types of remote imagery and 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. Prerequisite: 3433 or 3313 or 4333. Evaluation and application of various manual and computer-assisted Geographic Information Systems (GIS); 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: consent 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: consent of instructor. Specialized physical, social and methodological topics in geography.

4921 Applications of Geographic Analysis. Prerequisites: 3253, 3353. For geography majors or minors only. Applications of concepts and techniques relating to the students' specialization. Designed to reinforce and synthesize the knowledge gained from previous course work.

4930* Readings in Geography. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Directed readings on selected topics, regions or methods in geography.

4993 Senior Honors Thesis. Prerequisites: departmental invitation, senior standing, Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a senior faculty member, with second faculty reader, both of whom will be present at an oral defense of the thesis. Required for graduation with honors 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. 1-9 credits, maximum 9. Prerequisites: consent of departmental adviser and consent of instructor. Practical experience, stressing geographical concepts to societal problems. Emphasis on programs in planning and geographic education.

5111* Advanced Geographical Analysis I. Lab 2. Prerequisites: 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.

5111* Remote Sensing of the Physical and Cultural Environment. Prerequisite: undergraduate course in remote sensing and basic 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 geographic 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 trips.

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: graduation in geography or consent of instructor. Specialized topics in geography.

5463 Progress in Physical Geography. Prerequisite: graduate standing in geography. Review of recent literature in light of current physical geography research themes.

5473 Progress in Human Geography. Prerequisite: graduate standing in geography. Review of recent literature in light of current human geography research themes.

5510 Research Problems in Geography. 1-3 credits, maximum 9. Prerequisite: consent of instructor.

5713* History and Philosophy of Geography. Prerequisite: geography major or minor. Emphasis on growth, development, and evaluation of major themes in geographical research and teaching.

GEOLGY (GEOL)

1014 (N)General Geology. Lab 2. The influence of geography and applied 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.

1114 (L)Physical Geology. Lab 2. 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.

1124 Physical Geology for Petroleum Technologists. 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.

2013 (N)Scenic Geologic Regions. Prerequisite: 1014 or equivalent recommended. The beauty of national parks and scenic regions in North America and throughout the world.

2031 (N)Geologic Field Investigation. Prerequisite: introductory geology. One week of required field study at sites of geological interest and significance.

2253 Mineralogy. Lab 3. Prerequisites: 1114 or equivalent, or 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.

2364 Elementary Petrology. Lab 3. Prerequisite: 2254. Origin, occurrence and classification of rocks; hand specimen identification. 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 1813 and PHYSC 1114. Behavior of earth materials during various deformational processes and analysis of the resulting structural features. Field trips required.
3023 Geology for Engineers. Lab 1. Prerequisite: junior standing in engineering. Physical geology with emphasis on applications to civil engineering. Field trips required.

3072* Structural Geology. Lab 3. Prerequisite: 1224, Principles of structural geology and their applications. Laboratory emphasizes realistic practical problems undertaken in the field and in the laboratory. Field trips required. Nonmajors may receive graduate credit.

4993 Senior Honors Thesis. Prerequisites: departmental invitation, senior standing, Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a senior faculty member, with second faculty reader and oral examination. Required for graduation with departmental honors in geology.

5000 Thesis. 1-6 credits, maximum 6. Prerequisite: approval of graduate committee. Written work toward master's thesis in geological science.

5050* Problems in Economic Geology. 1-3 credits, maximum 6. Prerequisite: consent of instructor. In-depth examination of problems in economic geology. Field trips may be required.

5100 Field Geology. 1-4 credits, maximum 8. 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: PHYSC 1425, PHYS 1503. 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 microfossils. Student projects on assigned fossil groups with presentation of results both orally and in writing. Field trips required.

5203 Advanced Structural Geology. Lab 3. Prerequisite: 3014. 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: 3546, 5203. Use of subsurface geologic information from cores and well logs to prepare maps and identify oil and gas prospects. Field trips required.


5323 Advanced Well Log Analysis. Lab 3. Prerequisites: 3033 or 3124. 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.


5403 Geochemistry. Prerequisites: 2364 and general chemistry. Application of chemical principles to geologic processes. Emphasis on chemical sedimentology, stable isotopes, and Eh-pH diagrams.

5443 Engineering Geophysics. Lab 3. Prerequisites: 1114 or 3024; PHYS 1214 or equivalent. Geophysical aspects of problems associated with environmental engineering, ground-water pollution and regional and urban planning. Problem assessment and field methods. Two required field projects include geophysical surveys using resistivity and seismic refraction methods. Field trip required.

5453 Advanced Hydrogeology. Lab 3. Prerequisites: 4453, COMSC 2113 or equivalent, MATH 2265 and 2365 or equivalent. Advanced quantitative techniques used to address ground-water management and pollution. Advanced field and laboratory techniques as well as management and chemical transport models applied to address field problems and case studies. Field trips required.

5503 Environmental Geology. Prerequisite: 3073. Application of principles of geology to environmental studies and to land and resource planning and development. Methods of acquiring, compiling and transferring geologic information for the purposes described above, with emphasis upon environmental geologic mapping. Field trips required.

5523 Organic Geochemistry. Lab 3. Prerequisite: introductory chemistry. Introduction to some environmental aspects of organic geochemistry. Soils and sediments as pollutant receptors, sources of pollutants and selected aspects of environmental health.


5603 Basin Analysis. Lab 1. Prerequisites: 3546, 5203, 5223, 5253, 5363. Team-taught course. Interpretations of the evolution of selected sedimentary basins. Emphasis on facies analysis, petrography, diagenesis, and structural evolution. Field trips required.

5710 Advanced Studies in Geology. 1-4 credits, maximum 8. Prerequisite: consent of instructor. Independent reading, 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.

2113 (H) Intermediate Conversation and Composition I. Lab 1. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Colloquial speech and grammatical rules. May be taken concurrently with other 2000-level German courses.

2113 (H) First Readings in German. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Selections from German newspapers and contemporary material. May be taken concurrently with other 2000-level German courses.

2222 (H)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.

2222 (H)Introduction to German Literature. Prerequisite: 1225 or equivalent competence. (May have been gained in high school.) Reading and analysis of prose, drama and poetry. Literacy appreciation. May be taken concurrently with other 2000-level German courses.

3013 German for Reading Requirements I. Reading in the humanities and sciences. Translation from German to English.

3023 German for Reading Requirements II. Prerequisite: 1225 or equivalent. Intermediate and advanced reading in the humanities and sciences. Translation from German to English.
Survey of German Literature II. Prerequisite: 20 credit hours of German or equivalent. Historical, cultural, political and literary trends in the formation of German civilization.

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.

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.

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.

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 stylistics.

Orientation to Internship Abroad. Prerequisite: 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.

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.

Survey of German Literature I. Prerequisite: 20 credit hours of German or equivalent. German literature from the beginning to 1785.

Survey of German Literature II. Prerequisite: 20 credit hours of German or equivalent. German literature from 1785 to the present.

The Age of Goethe. Prerequisite: 20 credit hours of German or equivalent. Principal figures of German Classicism and Romanticism.

19th Century German Theater. Prerequisite: 20 credit hours of German or equivalent. Kleist, Buchner, Grillparzer, Hebbel, Hauptmann and others.

19th Century German Novelle and Lyric. Prerequisite: 20 credit hours of German or equivalent. Prose and lyric from Romanticism to Naturalism.

20th Century German Literature. Prerequisite: 20 credit hours of German or equivalent. Main currents in German literature from Naturalism until present day.

Studies in German. 1-3 credits, maximum 9. Prerequisite: 20 credit hours of German or equivalent. Reading and discussion of vital subjects in German.

GREEK (GREEK)

Elementary Classical Greek I. Grammar and vocabulary of Ancient Greek.

Elementary Classical Greek II. Prerequisite: 1113 or equivalent. A continuation of 1113. Grammar and readings of classical Greek authors.

Elementary Classical Greek III. Prerequisite: 1223 or equivalent. A continuation of 1223. Grammar and readings of classical Greek authors.

Intermediate Readings. Lab 2113 or equivalent. An introduction to a variety of classical authors to increase reading facility and grammatical comprehension.

Advanced Readings. 1-6 credits, maximum 9. Prerequisite: 2013. Prose authors, epic poetry, drama, Koine Greek and religious texts.

HEALTH (HLTH)

Foundations in Health Education and Wellness. Analysis of major concepts, e.g., degenerative disease, human exercise capacity and health behavior.

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.


Total Wellness. Knowledge, attitudes and practices related to self-direction of health behavior for total well-being.

Applied Anatomy. Action and location of individual muscles and muscle groups. Anatomy as applied to a living person. Common anatomical injuries and diseases will be presented with each joint structure.

Care and Prevention of Athletic Injuries. Prerequisite: 2653. Symptoms of common athletic injuries, their immediate treatment and care.

Community Health Programs. Structure and function of health agencies and programs in the total community.

School Health Programs. Prerequisite: 2603. The identity and relationships of school health instruction, services and environments.

Advanced Care and Prevention of Athletic Injuries. Lab 2. Prerequisite: 2633. Advanced techniques applied to athletic injuries.

Wellness Lifestyles. Traditional concepts of wellness examined and evaluated, with emphasis on contemporary application.

Fitness and Weight Management. Prerequisites: FNA 1113 or PHSI 3113. Knowledge about the conditions and problems associated with fitness and weight control. Scientific literature on the health aspects of obesity, various techniques for assessing body composition, exercise and eating programs for optimal fitness and weight management.

Methods In School and Community Health Education. Conceptual and value approach to health education through a variety of teaching methodologies.

Health and Aging. Prerequisite: 2603. An in-depth study of physiological aspects, special health needs, chronic illnesses, delivery systems and services for the aging.

Athletic Therapy Modalities. Lab 1. Prerequisite: 4902. Commonly used therapeutic devices used for training rooms.

Human Electrocardiographic Interpretation. Prerequisite: PHSI 3113. Knowledge concerning the collection and interpretation of the electrocardiogram (EKG) and its relationship to heart anatomy, physiology and electrophysiology.

Athletic Rehabilitation. Lab 1. Prerequisites: 2653, 3663. Scientific methods in conditioning athletes and rehabilitation of injured athletes. Practical rehabilitation will be under the direct supervision of the OSU medical faculty.

Strategies In Teaching Human Sexuality. Prerequisite: 2603. Development of techniques, strategies, and methodologies for teaching sex education in schools and/or community settings.

HEALTH, PHYSICAL EDUCATION AND LEISURE (HPEL)

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.

Health and Physical Education for Elementary Age Children. Prerequisite: HLTH 2603. Methods of teaching health and physical education to elementary age children. Two eight-week sessions: one session for health and nutrition instruction, and one session for physical education instruction.

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.

Internship. 4-16 credits, maximum 16. Prerequisite: last semester-senior year status with cumulative GPA of 2.50. Supervised field work experience in health, physical education or leisure.

Thesis or Report. 1-6 credits, maximum 6.

History and Philosophy of Physical Education. The history and philosophies of physical education beginning with ancient Greece and continuing through modern Europe and America.

Seminar. 1-2 credits, maximum 4. Selected topics from the profession not covered in other courses. Presentation and critique of research proposals and results.

Health, Physical Education and Leisure Workshop. 1-6 credits, maximum 6. Selected areas of health, physical education and leisure.

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.

Field Problems In Health, Physical Education or Leisure Sciences. 1-6 credits, maximum 6. Individual investigations.

Trends and Issues in Health, Physical Education and Leisure Sciences. Major trends and issues in health, physical education and professional preparation; principles, practices, problems and improvements in HPELS; future needs and program innovations.

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 conceptual understanding of theory, tools and processes involved in designing research studies.
5063* Statistical Computing and Proposal Writing. Prerequisite: 5053. Instruction in the use of SPSS-x and BMDO software using WYLBUR. Preparation of research proposals for students in health, physical education and leisure.

5073* Sport: Psychological Aspects. Psychological foundations of sport emphasizing performance enhancement by athletes through psychological training techniques.

5143 Health Promotion and Marketing. Prerequisite: HLTH 4333. Conceptual and practical work in dealing with health topics as they apply to targeted populations. Direction in developing needs assessment and measuring tools in behavior modification with strong emphasis on health promotion proposal writing and marketing strategies.

5413 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, 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 work-experience-based program for educators and human service professionals utilizing Colorado Outward Bound Schools experiential educational model for adapting traditional teaching methodologies.

5463* Issues in Therapeutic Recreation. Prerequisite: LEIS 2433 or professional experience in therapeutic recreation. Current issues in therapeutic recreation with emphasis on accreditation, certification, licensure, quality assurance and ethics.

5473* Leisure and Aging. Prerequisite: LEIS 2433 or consent of instructor. Overview of the leisure needs and services for older adults, with emphasis upon the delivery system and leisure interventions.

5483 Therapeutic Recreation for the Physically Disabled. Prerequisite: LEIS 3483 or consent of instructor. Role of therapeutic recreation in the treatment and rehabilitation of individuals with physical disabilities with emphasis upon terminology, prognosis, etiology of specific disabilities program development and assessment.

5493 Recreation for the Emotionally Disturbed and Mentally Retarded. Prerequisite: LEIS 3843 or consent of instructor. Leisure services for the emotionally disturbed and mentally retarded with emphasis upon prognosis, treatment and methodologies of recreation programs.

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.


5613 Cardiac Rehabilitation. Prerequisites: HLTH 2653 and HPH 3113 or equivalent. Factors involved in cardiovacular disease. How today's treatment and administration of cardiac rehabilitation programs.

5723* Curriculum Development In Health, Physical Education and Leisure Services. Identification and analysis of curriculum theories with emphasis on traditional and innovative approaches to curriculum design for programs in HPELS.

5733 Motor Learning. Research in psychology and physical education relevant to the understanding of the nature and basis of motor skill learning.

5763* Administration of Health, Physical Education, Leisure and Sports Programs in Higher Education.

5773 Physical Education for the Physically Handicapped. Prevention, detection and correction of remediable physical defects.

5793 Mechanical Analysis of Physical Education Activities. Prerequisites: HLTH 2653, 3663, HPELS 5503 and 5843. Application of physical laws to physical education activities.

5823 Advanced Applied Anatomy. Prerequisite: HLTH 2653. State and major areas of the human body with emphasis on the relationship of physical activity to musculoskeletal and neurological factors.

5833 Methods in Physical Education. Prerequisites: PE 4712 and 3773, 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 CIED 5833.

5843* Quantitative Biomechanics and Kinesiology. Prerequisite: 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 I. Lab 2. Prerequisite: PSRI 3113 or equivalent. Theory and practice in resting and exercise EKG, stress test protocols and exercise prescription.

5863* Stress Testing and Exercise Prescription II. Prerequisite: 5853. Theoretical aspects of evaluating functional capacity through stress testing with the development of exercise prescription for special populations with physiological limitations imposed by age, disease, heredity and environment.

5873 Human Bioenergetics. Prerequisite: PSRI 3113 or equivalent. Human energy production, utilization and storage in response to exercise.

6010 Independent Study in Health, 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 station. To fulfill general education requirements as established by Regents’ policy.

1103 (S)Survey of American History. Meaning, vitality, and uniqueness of United States history since 1492 through a thematic examination of the nation’s past. Satisfies, with POLSC 1013, the State Regents requirement of six credit hours of history and government before graduation. No credit for students with prior credit in HIST 1403 or 1493.

1483 (S)American History to 1865. From European background through the Civil War. Satisfies, with POLSC 1013, State Regents requirement of six credit hours of history and government before graduation. No credit for students with credit in HIST 1103.

1493 (S)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 1013, State Regents requirement of six credit hours of history and government before graduation. No credit for students with credit in HIST 1003.

1613 (H,I,SpD)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.

1623 (H,I,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)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.

2313 (S)Oklahoma 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 undergraduates. Same course as POLSC 3003, 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 the Great 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 Kievan 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 development 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, 1350-1618. Religious reform in the context of political, economic and religious development 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 of 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.
History of Christianity. An intellectual and cultural history of Christianity from the second century to the present day. Same course as REL 3293.

3313

3323
Modern France, 1815-Present. French politics, economy, society, and culture from the defeat of Napoleon to France’s post-World War II “rebirth.”

3333
History of the Second World War. Problems leading to World War II with their international implications and consideration of the war years.

3353
Imperial Spain, 1450-1800. The rise and fall of the world’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.

3363
Medieval England: 55 B.C.-1485 A.D. English History from Roman Britain to the beginning of the Tudor period. Development of the English constitution from the early Germanic state through feudalism to the New Monarchy.

3383

3393
Modem 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 industrial state.

3403
East Asia to 1800. Traditional Chinese civilization and its impact on Japan, Korea and Southeast Asia.

3413
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
Modern Japan. Modernization process in Japan since 1868.

3433
European Colonialism. Response of China to the West since 1840, with stress on economic, social and intellectual currents.

3443

3463

3473

3813
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.

3823
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.

3833
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.

3843
The Jacksonian Era, 1828-1850. Development of a modern political system and an entrepreneurial economy; social reform; territorial expansion; and sectionalism.

3853
Civil War and Reconstruction, 1850-1877. Causes, decisive events, personalities and consequences of the disruption and reunion of the United States.

3863
Robber Barons and Reformers: U.S. History, 1877-1919. The impact of industrialization upon American society and politics. America’s rise to world power, the Progressive movement and World War I.

3873
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.

3874
Trans-Appalachian West. Settlement and development of the frontier east of the Mississippi River including the French and Spanish provinces, British occupation, Indian resistance and American conquest through the Jacksonian Era.

3875
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.

3876
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 Apaches, Comanche and other southwestern tribes, and the emergence of the modern Southwest.

3877
Old South. Social, political and industrial conditions in the South before the Civil War.

3878
New South. Recent history and major current social and economic problems of the southern regions of the United States.

3879
Indians in America. American Indian from Columbus to the present, emphasizing tribal reaction to European and United States cultural contract and government policy.

3893
History of Medicine. Historical growth of medicine and its relationship to the society in which it develops. Social problems, cultural, religious, and economic problems associated with the historical development of medicine.

3892
Science in Society. Impact of science on society and of society on science during selected periods of history.

3894

3973
Historical Methods and Interpretations. Required of all history majors. Introduction to historical methods and interpretations.

3980

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.

4273
American Foreign Relations Since 1917. American emergence as the decisive factor in the world balance of power.

4353
American Military History. Civil-military relations, the military implications of American foreign policy, and the impact of technological advances on warfare since colonial times.

4463
American Social and Intellectual History to 1865. American society in nonpolitical aspects: sections, classes, national culture and social structure, immigration, education, religion, reform, world influences; ends with Civil War.

4483
American Social and Intellectual History Since 1865. Continuation of 4463; may be taken independently. Emphasis on nonpolitical aspects of American society and thought and on world influences.

4503
American Urban History. Impact of urbanization upon American communities from 1865 to the present. Evolving political and social institutions, social change, technological innovations and planning theories.

4513
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.

4523
American Environmental History. Development of an environmental context for American history by probing the diverse and changing responses of Americans toward their environment.

4533
Blacks in America. Achievements of blacks in America and their participation in the development of the United States.

4543
Indians of Oklahoma. The Five Civilized Tribes and Plains Indians and their role in the history of Oklahoma to the present.

4553

4573
Women in Western Civilization. Women in the development of Western Civilization from the earliest times to the present.

4613
History of Culture in India. Literature and arts of India and Pakistan studied in their historical and philosophical context. Same course as REL 4613.

4980
Topics in History. 1-3 credits, maximum 9. For students interested in pursuing either a research or a reading project. Open to honors students in history and to others by permission of the department head.

4993
Senior Honors Thesis. Prerequisites: departmental invitation, senior standing, Honors program participation. A guided reading and research program ending with a honors thesis. Open to honors students in history and to others by permission of the department head.

5000
Thesis. 1-6 credits, maximum 6.

5023
Historical Methods. Methods of historical research and the writing of history.

5030
Applied History Internship. 3-6 credits, maximum 6. Prerequisite: consent of graduate committee. Supervised practical experience in applied history.

5120
Reading Seminar In American History. 3 credits, maximum 15. Historiographical and bibliographical study of special areas of American history.
**Professional Laboratory Experiences in Home Community Services**

1-3 credits, maximum 15. Research in selected problems in American history.

**Research Seminar in American History**

3 credits, maximum 15. Research in selected problems in American history.

**Doctoral Dissertation**

1-19 credits, maximum 30. Prerequisite: candidacy. Advanced research in history.

**Historiography**

Major writers of history, historical schools and patterns of developments in historical interpretation from the earliest times to present.

**Special Studies In History**

1-3 credits, maximum 36. The meaning and operation of the historical processes and develop capabilities for clarity of statement, investigation, and creative, critical attitude. Areas studied vary from semester to semester.

**Career Exploration In Home Economics**

Developing and applying concepts relating to individual values and goals to assist in career decision making. Required for all freshmen students in home economics.

**The Home Economist in the Contemporary World**

1-2 credits, maximum 6. Prerequisite: senior standing. Field experiences related to issues affecting the family in contemporary society and the unique responsibilities of the home economist as they interface as agents of change.

**Methods of Home Economics Research**

Methods of research in various areas of home economics including types of research and such aspects as problem definition, design, sampling, data collection, data analysis, reporting and reviewing. This course or equivalent required of all graduate students in home economics.

**Interdepartmental Home Economics Seminar**

Analysis of current issues from the perspective of home economics. Application of research findings related to issues.

**Research Seminar**

1-3 credits, maximum 3. Prerequisite: graduate course in research methods or consent of instructor. Research in home economics with emphasis on problems involving a multidisciplinary approach. Methodological analysis of research. Development and evaluation of research focused on current problems.

**Seminar In Home Economics**

1-3 credits, maximum 3. Prerequisite: consent of instructor. Analysis of philosophy, critical issues, current developments and interrelationships among elements in home economics.

**Home Economics Curriculum Development and Evaluation**

Lab 2. Prerequisite: full admission to Teacher Education. Theory and application of models of design, development and evaluation. Administration and interpretation of assessment techniques; design and use of teacher-made tests. Utilization of educational objectives, strategies, resources, and evaluation of learning and programs.

**Philosophy of Home Economics Education**

Based for developing a home economics education philosophy as related to present day theories of education including multi-cultural education, diversity of learners, characteristics of effective teachers, ethical considerations and other major contemporary issues in public education.

**Managing Career Decisions**

Applications of decision making models for career and life planning. Self-assessment, career alternatives, career mobility, work/family issues and resource identification. Student seeking teacher certification will complete a module on methods of teaching career education.

**Home Economics: Professionalism, Issues and Audiences**

History and philosophy of home economics. Current issues and strategies for professional development, integration of core concepts and theories, and implementation in public policy.

**Strategies for Teaching**

Learning theories and strategies for planning, teaching and evaluating formal and nonformal programs. Not applicable for teaching licensure.

**Seminar in Vocational Home Economics**

1-4 credits, maximum 4. A study of the bases for vocational home economics, its diverse audiences and its relationship to all areas of vocational education.

**Extension Programs In Home Economics**

Development, organization and methods of home economics public service programs.

**Media, Materials and Techniques in Home Economics Education**

Lab 6. Prerequisite: 3313 and full admission to University Teacher Education. Application of educational principles to specific home economics subject matter. Experiences with verbal and non-verbal communication, teaching and evaluation techniques, audiovisual materials, computers and a variety of teaching aids. Development of proficiency in use of various media.

**Organization of School and Community Home Economics Programs**

Prerequisite: full admission to teacher education. Responsibility and activities of the school home economics teacher in youth organizations, adult education, and effective interaction with parents and community.

**Strategies for Working with Adults in Community Services**

Theories of adult development as they affect learning activities of adults in family-related programs. Implications are analyzed in relation to planning and selecting programs, media, and teaching strategies.

**Management of Volunteer Programs**

Prerequisite: junior, senior or graduate standing. For family and human service professionals who will have responsibility for utilizing volunteer personnel in achieving program goals. Overview of issues in volunteering, management and leadership strategies for maximizing volunteer effectiveness and strategies for evaluating volunteer service.

**Field Experience In Home Economics Education and Community Services**

1-8 credits, maximum 8. Prerequisites: consent of adviser and department head. Supervised observation and engagement in programs serving the educational needs of families.

**Seminar in Occupational Home Economics**

1-6 credits, maximum 6. Organization, outlook and current trends in occupational home economics programs. Explores requirements for employment in business, industry, home-based business and self-employment.

**Student Teaching In Home Economics**

1-12 credits, maximum 12. Lab 3-36. Prerequisite: full admission to Teacher Education and student teaching. Study and development of a plan for the supervised teaching experience in home economics education through directed teaching experience in an approved vocational program. Participates in the beginning of the semester in the assigned school.

**Independent Study In Home Economics Education and Community Services**

1-6 credits. maximum 8. Prerequisite: consent of instructor. Various units of work related to specific problems in home economics education.

**Program Planning**

2-4 credits, maximum 4. Factors that influence planning and change in educational programs relating to community services and home economics. Principles of program development in agencies and institutions with differing purposes and organizational structures.

**Conference and Meeting Planning**

Prerequisite: junior, senior or graduate standing. Planning and implementing conferences, teleconferences, conventions, special events and seminars related to greeting, promoting, managing and evaluating educational events.

**Masters Thesis or Report**

1-6 credits, maximum 6. Prerequisite: consent of major adviser. Research in home economics for M.S. degree.

**Seminar in Family and Community Services**

1-6 credits. Prerequisite: consent of instructor. Philosophy, trends, and issues affecting leadership, management, implementation, and accountability of family and community service organizations.

**Research Methods in Home Economics**

Recent problem areas and techniques of home economics research, followed by experiences in identifying researchable problems, planning and selecting procedures for carrying out studies and interpreting findings.

**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.

**Administration and Supervision of Nonformal Education Programs**

Prerequisite: graduate standing. Contemporary theories on administrative skills, management and supervision, and supervisory behavior as they relate to goal orientation, performance, productivity, and professional development.

**Contemporary Programs In Home Economics Education and Community Services**

Educational philosophies, trends, policies and issues that impact upon home economics and community service programs.

**Participative Leadership**

Prerequisite: graduate standing. An examination of contemporary theory and practice related to participative leadership, collaborative planning, and shared 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.

**Teaching Consumer Education and Resource Management**

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.

**Supervision of Student Teaching In Home Economics**

2-3 credits, maximum 3. Prerequisite: teaching experience. The preparation of home economics teachers with emphasis upon the provision of learning experiences for student teachers.
HONORS (HONOR)

2013 (S) Honors Law and Legal Institutions. Prerequisite: Honors program participation. An introduction to law in American society and its relationship to its European origins; its political, economic, psychological, and sociological dimensions; and the substantive law in selected areas. Introduction to legal reasoning and legal research techniques. For the Honors student.

2113 (H) Honors Western Humanities: Ancient and Medieval. Prerequisite: Honors program participation. Interdisciplinary study of art, history, philosophy, literature, theater, and music from the Renaissance to the present. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student.

2223 (H) Honors Western Humanities: Modern. Prerequisite: Honors program participation. Interdisciplinary study of art, history, philosophy, literature, theater, and music from the Renaissance to the present. Team-taught by faculty from appropriate disciplines in a lecture and discussion format. For the Honors student.

HORTICULTURE (HORT)

1002 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 outdoor plants. Intended for non-majors only.

1013 (N) Principles of Horticulture and Landscape Design. Lab. 2. Horticultural principles and practices; basics of landscape design; characteristics and use of horticultural plants; scope and development of the horticultural industry.

2112 (N) Indoor Plants. Lab 2. Prerequisite: 1013. Identification, cultural requirements and use of ornamental foliage and flowering plants for indoor gardens.

2212 Herbaceous Plants. Lab 2. Prerequisite: 1013. Identification, cultural requirements and landscape value of ornamental flowering herbaceous plants.

2653 Basic Floral Design. Lab. 2. Fundamentals of floral arrangement and design for the home and the retail shop; basic skills useful to flower shop employment and operation.

3010 Internship in Horticulture. 1-6 credits, maximum 6. Prerequisites: 45 credit hours and approval of adviser. Supervised work experience with approved public and private employers in horticulture and related fields. Credit will not substitute for required courses. Graded on a pass-fail basis.

3013 Arboriculture. Lab 2. Prerequisites: 3312 and 3322 or FOR 2134, and AGRON 2124. Selection, planting, establishment, nutrition, pruning, pest and disease control and other maintenance considerations for trees, shrubs and vines.

3083 (L) Plant Propagation. Lab. 1. Prerequisites: 1013, AGRON 2124 and BISC 1403. BOT 3333 or 3463 suggested. Principles and practices involved in propagation of plants. Anatomical, morphological and physiological aspects of sexual and asexual methods of regeneration and their importance.

3113 Greenhouse Management. Lab. 3. Prerequisites: 1013, 2112, BISC 1403 and MATH 1213. Commercial greenhouse operation with emphasis on floricultural plant production aspects; environment, growing media, fertilizers, and application methods, watering, pest and disease control, chemical growth regulators, production costs.

3153 Turf Management. Prerequisite: 1013. AGRON 2124 and 2 hours plant science. Selection, establishment and maintenance of grass species and other plant materials for special use areas.

3213 Fruit and Nut Production. Prerequisite: BISC 1403. Commercial production of fruits and nuts, with emphasis on apple, peach, strawberry, blackberry and blueberry. A two-day field trip is required.

3312 Landscape Plant Materials I. Lab 2. Prerequisite: BISC 1114 or 1403. Identification, adaptation, tolerance and use of evergreen trees, shrubs, vines and ground covers in the landscape.

3322 Landscape Plant Materials I. Lab 2. Prerequisites: 3312 and BISC 1114 or 1403. Identification, adaptation, tolerance and use of evergreen trees, shrubs, vines and ground covers in the landscape.

3433 Commercial Vegetable Production. Prerequisites: 1013, AGRON 2124 and BISC 1403. Commercial production and marketing of vegetable crops.

3544 Nursery Production. Lab. 2. Prerequisites: 3312 and 3322. AGRON 2124, BOT 3463, PLP 3344 and any course in entomology. The propagation, production, management and marketing of commercial nursery stock.

3553 Advanced Floral Design and Marketing. Lab. 2. Prerequisite: 2652. Preparation, arrangement, care and marketing of floral products in the retail shop, advanced designing, pricing, wholesale purchasing and retail selling.

4212 Vocational Horticulture. Lab. 4. Prerequisite: concurrent enrollment in AGED 4200. An overview of horticulture including floriculture, ornamentals, vegetables, landscape design, fruits and nuts as they relate to vocational agriculture programs. Taken in conjunction with AGED 4200.


4453 Turfgrass Science. Lab. 3. Prerequisite: 3153. Investigation of environmental stresses imposed on turfgrass and the interaction between stress and the cultural practices of turfgrass.

4670* Horticultural Seminar. 1-2 credits, maximum 2. Required of horticulture seniors, except those choosing education 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. 1-2 credits, maximum 20. Selected research problems in horticulture, floriculture, landscape design; nursery production, olericulture, and pomology.

5120* Horticulture Science. Prerequisites: BOT 3463, BOT 3460 or equivalent or senior standing. The basics of applied physiological responses of plant growth with relation to horticulture plants. Includes hormonal, genetic and environmental influences on horticultural plant growth and production.

5233* Experimental Horticulture. Methods of conducting research with horticultural crops including organization and plans, field plot techniques and analysis of data.

Mineral Nutrition in Horticultural Crops. Prerequisite: BOT 3463, AGRON 4234. Fertilizer use and plant response in horticultural crops.

Flowering and Fruiting in Horticultural Crops. Prerequisite: BOT 3463. Environmental, chemical and cultural factors affecting the flowering and fruiting of horticultural crops.

Postharvest Physiology. Prerequisites: BOT 3463 and 4560. Physiological causes for postharvest changes in horticultural crops (ripening and senescence) and the basis for certain postharvest treatments (precooling at harvest, conditioning, storage, transportation, packaging and handling). Commodity-specific postharvest phenomena.


HOTEL AND RESTAURANT ADMINISTRATION (HRAD)

Orientation and Survey of Hotels and Restaurants. Career opportunities and the scope, development and history of the mass feeding and housing industries.

Introduction to Professional Food Preparation. Lab 3. Techniques and theories of food preparation including use and selection of equipment, sanitation and quality controls.

Professional Sanitation in Food Service Industry. Lab 1. Prerequisite: introduction to professional food preparation. Operation of food service facilities. Sanitation for the hospitality industry. Food preparation and service, equipment, and guest accommodations.

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 FNA 2123.

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.

Multi-unit Food Operations. Lab 4. Prerequisites: 3111 and 3123. Experience in operations of multi-unit food services in a variety of work stations.

Institutional Furnishings. Furnishings other than mechanical equipment: furniture, textiles, rugs and linens.

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.

Science of Food Preparation. Prerequisites: 1113 or FNA 2113. Organic chemistry. Application of scientific principles on food preparation. Same course as FNA 3133.

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 FNA 3213.

Management of Multi-unit Food Service Systems. Prerequisite: 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.

Hospitality Work Experience. 1-6 credits, maximum 6. Supervised experience in an approved work situation related to a future career in the hospitality industry.

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 it does. Energy utilization and conservation stressed.

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 FNA 3553.

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.

Hotel and Restaurant Promotion and Sales. Prerequisite: 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.

Food, Beverage and Labor Cost Controls. Prerequisites: ACCTS 2203, junior standing. Food, beverage and labor cost control systems associated with hospitality industry operations. Same course as FNA 4333.

Quantity Food Production Management. Lab 4. Prerequisites: HRAD 2123, 3133, 3553, a course in accounting or mathematics. Operations, purchasing, preparation and service of food for large groups. Same course as FNA 4363.

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.

Institutional Food Service Layouts and Equipment. Prerequisites: 3103, 4733, 4763. Space allocations and equipment arrangements will be studied utilizing time- and-motion efficiency. Specifications for institutional equipment.

Hospitality Facilities Layouts. 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.

Organization and Management. Prerequisite: 3553, 4363 or FNA 3553, 4363. Organization of personnel and resources in a food service institution and the techniques required by the manager. Lab consists of work experiences in Residence Halls Food Services. Same course as FNA 4573.

Institution Administration. Lab 3. Prerequisite: 4573 or concurrent enrollment. Supervised administrative responsibilities in food services and related institutions such as hotels. Same course as FNA 4693.

Supervision 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.

Special Unit Course In Hotel and Restaurant Administration. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Study of units of study related to specific problems in the hospitality industry.

Multi-unit Food Service Management. Prerequisites: 4883, MGMT 3313. Study of policy and procedure influencing the human side of hospitality management. Management decisions of multi-unit franchising, finance, menu strategy and marketing.

Approved for Graduate Credit

Housing, Interior Design and Consumer Studies (HIDCS)

Graphic Design for Interiors. Lab 6. Interior design majors only. Drafting and visual communication techniques related to interiors.

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.

Presentation Techniques for Interior Design. Lab 6. Interior design majors only. Two- and three-dimensional presentation techniques using various media and formats.

Introduction to Interior Design. Lab 2. Basic interior design theory including aesthetic, social and economic aspects. Organizational environment in relation to needs, values and goals of individuals and families.

Resource Management for Individual and Family. Principles and procedures of management and their relations to human and material resources. Emphasis given to the consumer in the marketplace, financial management and time and energy management.

Interior Design Studio I: Residential. Lab 4. Prerequisites: 1123 and 2223. Studio course 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.

Heritage of Interiors I. Religious, civic, commercial, and domestic architecture and furnishings prior to and including the 18th Century with emphasis on the periods which have greatly influenced housing and interior design.

Design of Interior Components. Lab 4. Prerequisites: 1123 and 2313. Design, materials, construction and production of interior design components including custom furnishings and interior treatments and modification.

Environmental Design for Interior Spaces. Prerequisite: 3243. Design factors and human performance criteria for lighting, acoustic and thermal/ atmospheric comfort as they relate to the practice of interior design.

Supervised Field Experience. 1-3 credits, maximum 6. Prerequisites: 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 and marketing of interior spaces.

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 4. Prerequisite: 3213, 3243, 3303, 3333 and 3343. Studio course utilizing the design process in the analysis of office planning including systems and specifications.

Families 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 microwaves and other technologies for management of the home.
Provisional Internship. 1-6 credits, maximum 6. Prerequisite: 3823 and consent of instructor. A supervised experience with attention of the development principles to the use of family resources through field study or design problem.

4163 (H,I) Housing In Other Cultures. Housing and interior design of home and small scale environments in cultural belief, attitudes, family patterns and environmental influences.

4263 Interior Design Studio III: Commercial and Residential. Lab 4. Prerequisites: 3253, 3363 and 3823. Studio course utilizing the design process in the analysis and planning of commercial, institutional and retail environments with emphasis on materials, codes and accessibility.

4293 Interior Design Studio IV. Lab 6. Prerequisite: 4263. Studio course developing comprehensive interior design of family housing in the areas of historical restoration/preservation/adaptive reuse and custom residential planning.

4323 (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.

4413 Work Environments and Human Performance. Planning and work areas for confidence, comfort and contribution to family living. Analysis of home lighting and utilities for work areas, application of time, motion and work simplification in planning work areas.

4422 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 of the development of professional competence as well as personal skills.

4443 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.

4463* (S) Women in the Economy. Prerequisites: 2413 and 1113. Economic roles of women in American society as consumers and producers in the marketplace and in the home. Exploration of issues raised by the changing economic status of women.

4473 Economics of Aging. Principle economic elements of aging including employment and retirement decisions, changes in amount and sources of income, consumption patterns and living arrangements.

4810 Analysis of Current Literature Including Research in Housing, Design and Consumer Resources. 1-2 credits, maximum 2. Analysis of current research in relation to housing, design and consumer resources.

4820 Professional Internship. 1-6 credits, maximum 6. Prerequisite: 3823 and consent of instructor. A supervised internship experience which simulates the responsibilities 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.

5000 Masters Thesis. 1-6 credits, maximum 6. Individual research relating to problems and thesis.

5110 Research Development in Housing, Interior Design and Consumer Studies. Prerequisites: graduate standing and concurrent enrollment in HEC 5102. Current developments and needs in research in HIDCS including application of research methods to HIDCS and research planning.

5240 Contemporary Interior Design Philosophies. Prerequisite: consent of instructor. Interior design philosophies of contemporary designers and trends in interiors.

5250 Studio Design Practicum. 1-3 credits, maximum 6. Prerequisite: consent of instructor. An in-depth application of theoretical design models and philosophies to professional practice.

5260 Historic Interior Design. 1-4 credits, maximum 4. Prerequisite: consent of instructor. Influential periods of architecture and furnishings including historical preservation.

5333 Family and Consumer Policy Issues. Prerequisite: senior or graduate standing. Identification and assessment of the effects of federal and state legislation on families and consumers. Effects of policies in income maintenance, housing, health, education, social services, employment and contract law.

5343 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.

5360 Advanced Studies in Housing, Interior Design and Consumer Studies. 1-6 credits, maximum 6. Investigation into special areas in the fields of housing, design and consumer studies. A maximum of 6 hours to be used by graduate students following Plan III for the master's degree.

5363 Housing and Energy. Prerequisite: consent of instructor. The impact of changing energy supply and cost on housing. Energy and housing policies, alternative energy sources and future implications.

5413 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.

5423 Family Economics. Prerequisite: senior or graduate standing. Individuals and families interaction in the labor market-decision making regarding time allocations among wage earning, household production and leisure. Economic well-being of individuals and families regarding human capital accumulation, poverty programs, two-earner families, one-person-headed households, and distribution of wealth.

5433 Family Financial Security. Prerequisite: 3433 or consent of instructor. Socioeconomic changes, public policies and programs and management practices related to family financial well-being.

5440 Contemporary Consumerism: Issues and Action. Prerequisite: consent of instructor. Consumerism and the consumer movement in today's society. Objective analysis of current consumer issues, claims of advocates and opposition and involvement and/or action by consumers, business and government.

5453 Graduate Seminar in Interdisciplinary Consumer Education. Prerequisite: consent of instructor. For teachers and future teachers who wish 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.

5463 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 restrictions.

5473 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 business in relation to the profit motive in each segment of the market place.

5810 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 case involving one of the subject matter areas in the Department.

5830 Housing, Interior Design and Consumer Studies Seminar. 1-3 credits, maximum 6. Prerequisite: consent of instructor. A selected group of current issues in housing, design and consumer resources.

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.

6350 Real Estate Marketing. Prerequisite: 3353. Mechanics for allocating resources to the production of housing, supply and demand functions in the housing market, characteristics of the housing industry. The role and responsibilities of the consumer along with interactions among the many participants in the operation of the housing market.

6410 Independent Study In Housing, Interior Design and Consumer Studies. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Selected areas of housing, design or consumer resources for advanced graduate students working toward the doctorate degree.

6813 Family-Socio-Economic Issues and the Quality of Life. Prerequisite: consent of instructor. An analysis of social and economic trends and policy affecting resource use in household, consumer and leisure activities and the resulting quality of life.

6823 Economic and Social Foundations of Consumer Studies. Prerequisites: graduate standing, consent of instructor. The lives, times and ideas of great economic and social thinkers and how their influence on the economic and social development of our society affects the economics of family living.

6830 Housing, Interior Design and Consumer Studies Seminar. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Problems and recent developments in housing, design and consumer resources.

INDUSTRIAL ENGINEERING AND MANAGEMENT (INDEN)

2903 Introduction to Industrial and Systems Engineering. Lab 2. Prerequisites: ENGR 1412; MATH 2265. Industrial engineering concepts and techniques in production control, quality control, layout, methods engineering, material handling, mathematical programming, and engineering economy. Laboratory sessions provide additional learning experiences with these topics and with computer software used in industrial engineering analyses.
3302 Industrial Processes I. Lab 3. Prerequisite: ENGRSC 3313. Manufacturing processes used to transform raw materials into finished goods. Near-shape processing and basic metal cutting theory, process selection, and planning. Field trips to manufacturing plants.


3503 Engineering Economic Analysis. Prerequisite: MATH 2365. Development and use of time value of money interest factors for financial analysis. Determinant of present worth, annual equivalent, rate of return and payout periods. Decision making among independent, dependent, capital-constrained and unequal-lived projects. Replacement, break-even and minimum cost analyses. Depreciation and depletion methods and their effect on corporate income taxes, leading to after-tax cash flow analyses.


3603 Industrial Operations Analysis. Prerequisite: sophomores standing in Industrial Management, covering the major aspects of optimization, design and control. Decision making within a systems approach. Not available for credit in Industrial Engineering curriculum.

3703 Engineering Computation and Interactive Modeling Prerequisites: ENGR 1412 or COMSC 2123; and MATH 2265. Advanced programming techniques using pseudocode and Pascal. Using the computer for engineering analysis, design and problem solving.

3802* Industrial Safety Engineering. The theory of safety engineering with an emphasis upon fundamental concepts in the industrial environment.


3822 Human Performance. Lab 2. Human characteristics which affect the design of equipment, systems and jobs. Interaction of psychological, physiological, anatomical, social and engineering factors. Improvement of efficiency, safety and operator well-being.

4010 Industrial Engineering Projects. 1-3 credits, maximum 6. Prerequisite: consent of head. Special undergraduate projects and independent study in industrial engineering.

4014 Operations Research. Prerequisites: 3703, MATH 3623, STAT 4033. Fundamental methods, models, and computational techniques of operations research. Linear programming including transportation and assignment models. Network models, dynamic programming, decision theory, and queuing theory.

4023 Operations Research II. Prerequisites: MATH 2613, STAT 4033 and FORTRAN. Continued study of the fundamental methods of operations research; computational techniques, linear programming, queuing theory, inventory theory and analysis, queuing theory and analysis and simulation.

4106 Industrial Quality Control. Prerequisite: STAT 4033. Principles and practice of industrial control. Modern quality philosophy, including a process improvement strategy and management of quality and process improvement. Variables and attributes control charts for both discrete and continuous flow/batch processes. Process capability and performance analysis including strengths and weaknesses of Cp and Ppk indices. Introduction to acceptance sampling, including ANSI/ASQC Z1.4 standards.

4203 Factory Location and Layout and Material Handling Systems. Prerequisites: 3813 and senior standing. Design principles and analytical procedures for locating and developing an overall functional relationship plan and the methods for materials receipt, storage and movement for either an industrial or service oriented industry. Product-quality analysis and material flow, and information routing warehouse design, various layout methodologies, and their measures of merit. Introduction to material handling methods and technologies in automated systems. Case studies and field trips are required.

4323* Manufacturing Systems Design. Prerequisites: 3312, 3503. Design and operation of design, implementation, documentation, and control of manufacturing systems. Consideration of transfer lines, numerical control programming and design, and control and supporting activities such as cost, quality, and materials control. Introduction to basic computer-aided design and computer-aided manufacturing (CAD/CAM).

4413 Industrial Organization Management. Issues, concepts, theories and insights of management with a focus on productivity improvement through job design, productivity analysis, emphasizing effective performance.

4613* Production Control. Prerequisite: 4014. Concepts of planning and control of production environments. Design of operation planning and control systems. Techniques used in demand forecasting, operations planning, inventory control, scheduling, and process control. A production simulator is used to provide a realistic application experience.

4712 System Simulation. Prerequisites: 3703, 4014, STAT 4033. Simulation of discrete-event systems. Problem formulation, translation of problem to a computer model, and use of model for problem solution. Use of GPSS and other programming languages.

4723 Information Systems for Management Decisions and Control. Prerequisite: 3703. Systems engineering methodology applied to the design of information systems for management of all types of organizations. Activities are equivalent to those normally experienced by beginning professionals, and require both oral and written reports.

4913 Senior Design Projects. Lab 5. Prerequisite: limited to students in the final semester of their professional program. Student teams work on professional-level engineering projects selected from a wide range of participating organizations. Projects are equivalent to those normally experienced by beginning professionals, and require both oral and written reports. (Open only to students in Industrial Engineering and Management.)

4923* Energy and Water Management. Lab 2. Prerequisites: 3503, ENGRSC 2213, 3233. Design, implementation and management of energy and water management programs. Energy and water conservation, choice of energy sources, safety and security of fuel storage, contingency planning and use of standby fuels. Philosophy is to improve profits through optimal energy and water utilization. Outside speakers utilized when appropriate. Lab work required on audit equipment.

4933 Industrial Engineering and Management Seminar. Prerequisite: senior standing. Designed to orient seniors to their professional work environment. Topics include placement procedures, resume construction, interviewing skills, professional dress, graduate school, professional societies and registration, personal management of time, finances and energy. Taught by senior faculty; utilizes outside speakers.

5000* Research and Thesis 1-6 credits, maximum 6. Prerequisite: approval of major adviser. Research and thesis for master's students.

5003* Quantitative Foundations for Industrial Engineering. Prerequisite: MATH 2613 or 3623. Fundamental quantitative methods necessary for advanced study in various areas of engineering and business. Matrix algebra, linear regression, real analysis, calculus of finite variables and transform methods. Application of theorems to industrial engineering and related areas.

5010 Industrial Engineering Projects. 1-2 credits, maximum 6. Prerequisites: consent of school head and approval of major adviser. Special graduate projects and independent study in industrial engineering.

5013* Linear Programming. Prerequisites: 4014, or 5003, or MATH 3013; FORTRAN. Simplex algorithm to solve deterministic problems and underlying mathematical foundations. Large-scale models including computational considerations. Same course as COMSC 5013.

5030* Engineering Practice. 1-9 credits, maximum 12. Prerequisite: approval of adviser. Professionally supervised engineering practice experience. Supervision and authentic projects for which the student assumes a degree of professional responsibility. Activities must be approved in advance. Program consists of a part-time engineering experience, on-campus or in industry, or both, either individually or as a responsible group member. Periodic reports both oral and written required as specified by the adviser.

5032 Sequential Decision Processes and Dynamic Programming. Prerequisite: STAT 4033 and FORTRAN. The determination of policy that optimally allocates resources to the various stages of a finite-stage system. Deterministic and stochastic systems including serial systems, diverging branch systems, converging branch systems and loop systems.

5103* Advanced Industrial Quality Control. Prerequisites: 4103, STAT 4033. Modern quality philosophy and application. Theory and application of traditional and nontraditional control charting techniques. Special emphasis on statistical assumptions such as normality and error-free inspection. Oriented toward economically-based statistical monitoring of processes, including control charts, process capability analysis, such as sample size, frequency, and control limit spread.

5133* Stochastic Processes. Prerequisites: MATH 2613 and STAT 4033. Markovian processes, homogeneous and nonhomogeneous Markov processes, probability structure, mean and covariance function, the set of sample functions. Renewal processes, counting processes, point processes, periodic processes, stationary measures, and spectral analyses. Same course as STAT 5133 and MATH 5133.

5203* Advanced FacNi Location and Layout and Material Handling Systems. Prerequisite: 3503, 4014, 4203. A continuation and expansion of topics covered in 4203 which stresses the development of decision aids for routing and evaluating the effectiveness of production and/or service systems. Advanced analytical and computer techniques.

5303* Computer Integrated Manufacturing. Prerequisite: 4235. 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 or consent of instruc- tor. Introduction to robotics, systems engineering, design and selection of appropriate end effectors and sensors to produce a reliable cost effective robotic 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.
302* Industrial Arts and Technology Education for Elementary and Special Education Teachers. Lab 2. Educational Technology project studying student interest, developing and broadening student abilities, and generally enhancing the school program. Practical aspects of planning and implementing organized industrial arts and technology education activities in elementary and special education curriculums. Instruc-
tion in the selection, 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 the aspects involved in preparing to build, building and completing 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.

312 Electronic Communication Fundamentals. Lab 3. Prerequisite: 3023. A general introduction to contemporary electronic communication technology including telecommunications, hard wired, computer, light and acoustic systems. An overview of the products and implications of electronic communication systems and the nature of the electronic communication industry.

3101* Measurements Measurement for Occupational and Adult Education. Practical applications of the International Metric System 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.

3112 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.

3232 Manufacturing Processes. Lab 4. Prerequisite: 3033 or permission of instructor. Methods and procedures for processing 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.

3333 Industrial Communication Graphics. Lab 4. Methods and techniques for the visual communication of information and ideas. The elements of drafting, design, screen printing and photography into a total concept of modern graphic communication.

3423 Methods for Teaching Technology Education Systems. Lab 3. Prerequisites: 3033 and 3550 or consent of instructor. Unique methods and activities are specifically adapted for and related to the system of technology education. Fundamental and specific methods preparation for those students planning to teach technology education in the public schools.

3553 Manufacturing Enterprise. Lab 3. Prerequisite: 3033. The managed activities used to design, engineer, produce, and sell products and services with an emphasis on providing financial and personnel support for these 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, 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 and pneumatic 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.


422* Industrial Technology. Lab 4. Methods and procedures for manufacturing and processing techniques including automation and distribution systems as observed in films, 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 Program. 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. Specific emphasis placed on specific crafts that are most applicable to the elementary and special education curriculum.

5022 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. Prerequisites: 3033 and 3323 or equivalent or consent of instructor. Problems associated with the technical content areas in industrial arts and technology education. Introduction of new and advanced technical systems into the curriculum of public school technology education programs.

5443 Special Problems in the General Shop. Special problems concerning the organization and management of classes and the shop as well as special teaching methods and control.

5562* Critical Problems and Issues in Industrial Arts and Technology Education. Analysis of current issues, directions, and research in industrial arts and technology education. Applications to current classroom and program practices.

5663* Special Problems in Industrial Drawing. Special problems and techniques and methods applicable to the teaching of mechanical drawing in industrial arts courses. Selection and use of equipment, preparation of course materials and practice in the application of advanced techniques.

INTERDISCIPLINARY STUDIES (IDS)

3303 (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,SP)Religion: Psychological Interpretations. Recommended REL 1103 or PSYCH 2131. A study of the development theory and research of modern psychological perspectives on the religious experience. Same course as PSYCH 3733 and REL 3733.

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.

JOURNALISM AND BROADCASTING (JB)

1133 (S,SP)Mass Media in American Society. Growth and development of principal segments of the mass communication industry, including elementary professional concepts and current social and ethical issues.

1393 Mass Media Style and Structure. Elementary writing and design techniques in print, broadcasting and other media.

2013 Principles of Advertising. Prerequisite: sophomore standing. Elements and purposes of advertising; media functions, economic aspects, budgets, appropriations, rate structures and terminology.

2093 History and Significance of Film. The evolution of motion pictures and examination of film. Film in our society and how it affects the individual. The basis of impact, program evaluation and criteria for intelligent and discriminating listeners and viewers.

2183 Principles of Public Relations. An introduction to the history, development and current practice of public relations as a process in building relationships between organizations and the public.

2213 Introduction to Broadcasting. History, growth and development of radio and television; FCC and other federal regulatory agencies; station and network operations and their effect on society.

2393 Newswriting. Lab 3. Prerequisites: 1393 and 30 wpm typing ability. Reporting and writing through enterprise techniques for news coverage.

2413 News Editing I. Lab 3. Prerequisite: 2393. Copy editing and headline writing for newspapers and magazines.


2873 Radio-Television Announcing and Performance. Lab 3. Prerequisites: 1393 and 2873. The announcer and public relations officer's responsibilities as a professional communicator; analysis of announcing skills; drills in radio and television announcing and the development of an effective on-the-air personality.

3173 History of Mass Communication. Prerequisite: junior standing. Growth and development of mass communication systems in America, with emphasis upon the economic, social and political interaction of the media.

3293 Visual Communication. Use of photographs, charts, graphs, maps and other visual representations in the mass media; the language of pictures; theories of nonverbal communication visual aids in education and other information systems.

3583 Public Relations Management and Strategies. The practice and techniques of public relations as a management function in business, industry, government, education, agriculture, home economics and other fields. Designed for non-majors.

3400 Journalism, Advertising and Public Relations. Lab 3. Prerequisite: 3583. Fundamental communication skills in planning, researching, writing and editing materials used in public relations communications.

3553 Radio and Television News Writing. Lab 3. Prerequisite: 2393. Broadcast news writing and reporting techniques with emphasis on radio coverage. Familiarization with news values, news services, broadcast equipment. Lab work in news reporting and writing.

3603 Advertising Copy and Layout. Lab 3. Prerequisites: 2393, 2413. Advertising copy and layout; modern merchandising methods; application emphasizing local and regional problems.

3753 Graphic Communication. Lab 3. Creative and practical aspects of typography, layout, design and production of printed communication.

3823 Typography I. Lab 3. Taking and processing photographs; cameras, lenses, films, printing, and developing; essentials of good pictorial composition. For students who want an elementary understanding of photography, or to prepare for advanced work in photography or photojournalism.

3800 Radio-Television-Film Laboratory. 1-2 credits, maximum 5. Lab 6. Prerequisites: junior standing and completion of 1393 and 3553, or consent of instructor. Preparation and participation in all phases of radio-television-film, and cable through active internship program.

3913 Television Production. Lab 3. Prerequisite: 2873. Television production techniques including camera, audio, lighting, staging, graphics and on-camera performance.

4035 Communication Technology. Overview of satellite delivery of print media, radio, television and cable programs, data services, computer technology; public relations advertising uses of the new technologies.

4063 Supervision of High School Publications. Essential journalistic forms for high school publications; organizing and administering high school publications; intended to meet the requirements for the state teacher's license in language arts.

4123 Broadcast Promotion. Prerequisite: 2873. Nature, tools and techniques of promotion in radio, television and cable; concepts of evaluation of promotion effectiveness; ethics of broad and narrowcast promotion.

4133 Creative Newspaper Promotion. Prerequisite: senior standing. Community newspaper promotional methods; special pages, special editions, contests and self-promotion campaigns; counseling advertisers on merchandising efforts.

4153 Journalistic Management. Prerequisite: senior standing. Business and editorial management of newspapers, magazines, and industrial, business and farm publications.

4183 Advanced Public Relations. Prerequisite: 3183. Public relations publications planning, problem solving, management techniques, policies and case study analysis.

4223 Broadcast Sales. Prerequisites: 1393, 2213, 2873 and junior standing. Sales development, pricing, promotion and other aspects of broadcast sales and sales management.

4243 Programs and Audiences. Audience analysis, proper construction of programs for greatest appeal and use of appeals to attract the desired audience. Program types, rating systems, program selection and audience attention. Design and discussion of programs to reach specific audiences.

4263 Broadcast Management. Prerequisites: 1393, 2213, 2873. Functions, structure and organization of the broadcasting industry; special problems in broadcast station management, including personnel, sales, programming and government regulations.

4360 Special Problems in Journalism and Broadcasting. 1-3 credits, maximum 6. Prerequisites: junior standing and minimum of 3.00 GPA. Independent study and project development to fit the student's major or minor specialization.

4413 Advanced Reporting and Writing. Lab 5. Prerequisite: 2413. Enhancement of writing style and reporting techniques; evaluation of sources and polling practices, and investigative coverage of newsmakers and events.

4433 Feature Writing for Newspapers and Magazines. Prerequisite: 15 semester hours of English or journalism, including 4413 for journalism majors. Newspaper features and special articles for general circulation magazines, business and trade journals; sources, materials, markets and other factors pertinent to nonfiction writing.

4453 Communications in Agriculture. Fundamentals of newswriting and other communication methods; the role of the new media in agriculture and related fields. Same course as AG 4453.
3010 Internship In Landscape Architecture and Landscape Contracting. 1-6 credits, maximum 6. Prerequisite: 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.


3323* Landscape Architectural Design II. Lab 9. Prerequisite: 3313. The design of small to medium scale areas with an emphasis on design process and site analysis.

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.

3884* Landscape Architectural Construction II. Lab 4. Prerequisite: 3884. Advanced grading, roadway design including horizontal and vertical alignment, site layout and paving plans, advanced storm water management systems.


4164 Landscape Architectural Design III. Lab 8. Prerequisite: 3894 and 4013. Medium scale site development projects with an emphasis on landforms and structures.

4424 Landscape Architectural Design IV. Lab 8. Prerequisite: 4414. Medium-scale complex landscape architectural design projects with emphasis on arrangement and design of landscape elements that relate to functional and esthetic qualities. Integration of landscape construction detailing and drawings as part of design presentation.

4434 Landscape Analysis and Use. Lab 4. Prerequisites: 4024 and admission to landscape architecture program. The inventory and analysis of natural and man-made landscape resources and their application to land use.

4514 Landscape Architectural Design V. Lab 8. Prerequisite: 4424, 4894. The design of large-scale sites with an emphasis on mixed use developments.

4524 Landscape Architectural Design VI. Lab 10. Prerequisite: 4514. Large scale development project in urban design, recreation or resource planning.

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.


4990 Landscape Architecture Special Problems. 1-6 credits, maximum 6. Prerequisite: consent of appropriate faculty member. Landscape architectural related problems.

5110 Advanced Special Problems. 1-12 credits, maximum 20. Prerequisite: consent of appropriate faculty member. Specific landscape architectural problems.

LATIN (LATIN)


1223 (I) Elementary Latin II. Prerequisite: 1113 or equivalent proficiency, Continuation of 1113. Grammar, vocabulary and readings.

2213 Elementary Latin 111. Prerequisite: 1223 or equivalent. A continuation of 1223. Grammar and readings of Latin authors.

2213 (II) Intermediate Readings. Prerequisite: 2113 or equivalent proficiency. Prose selections in Latin from a variety of authors.

3330 (II) Advanced Readings in Latin. 1-6 credits, maximum 9. Prerequisite: 2213. Prose authors, poetry, and medieval Latin.

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; boutling; officiating and etiquette.

1223 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.


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.


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 resistance exercises. Basic elements of 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.

1212 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.

2213 Intermediate Golf. Lab 2. Prerequisite: 1232 or equivalent. Development of swing principles, analysis of errors in direction and distance, trouble shots, handicap, tournament play and rules.

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 of scuba diving; physics of scuba and skin diving.

2252 Dance Production. Lab 2. Prerequisite: 2312. Advanced technique, composition and staging.

2262 Intermediate Rebound Gymnastics. Lab 2. Prerequisite: 1262 or equivalent. Theory and practice of intermediate skills in tumbling, trampoline and mini-tramp; spotting techniques and safety skills.

2272 Modern Ballet. Lab 2. Theory and practice of fundamental skills and techniques of ballet through the use of modern themes.

2292 Beginning Jazz Dance. Lab 2. Theory and practice of fundamental skills and techniques for the contemporary form of jazz dance.

2292 Beginning Jazz and Tap Dance. Lab 2. Theory and practice of fundamental skills and techniques for tap and jazz dancing.

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, pomme 1, parallel bars and horizontal bars.

2372 Intermediate Swimming. Lab 2. Prerequisite: 1212 or and ability to swim 50 yards using 2 strokes. Theory and practice of strokes , diving techniques and water safety skills for the intermediate swimming level.

2413 Introduction to Recreation and Leisure. The nature, 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 Social 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, programs 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 Practicum. 1-3 credits, maximum 3. Prerequisites: 2413, 2422. Supervised practical experience with leadership responsibilities for planning, conducting and evaluating activities and programs.

3443 Camp Leadership. Lab 2. Philosophy of camping with an emphasis on leadership training for organized camp settings. 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.

3463 Program Design in Leisure Services. Emphasis on organization, supervision, promotion and evaluation of programs.

4733 Evaluation of Leisure Services. Prerequisite: 3463. Methods, techniques and application of the evaluation process related to a wide variety of leisure service functions and services, programs, personnel, facilities and organization.

3483 Principles and Clinical Practices in Therapeutic Recreation. Prerequisite: 2433. Clinical intervention techniques and strategies, including treatment techniques, leisure education and role of recreation in the treatment process.

3461 Pre-Intemship Seminar. Prerequisite: completion of 15 hours in LEIS. Preparation for internship in recreation and leisure services.

4213 Water Safety Instructorship. Lab 1. Prerequisite: American Red Cross Emergency Water Safety or Lifeguard Training Certificate. Methods of teaching swimming and aquatic safety with practical application of knowledge, principles and analysis of skills. May obtain American Red Cross Water Safety Instructor's Certification (WSI).


4453 Outdoor Education. Development of a holistic approach to teaching and learning in the outdoors. Learners will learn and practice the techniques necessary for acquiring skills with which to enjoy outdoor pursuits.

4463* Areas and Facilities in Recreation. Prerequisites: 2433, 2473 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: 473 or for 4553 or concurrent enrollment. Organization and administration of visitor centers and interpretive 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. Developing technical competence in back country navigation, emergency medical care and evaluation, winter nordic mountaineering, technical rock climbing, hazard analysis and expedition planning.

LIBRARY SCIENCE (LIBSC)

1011 The Use of Libraries and Learning Resources Centers. Orientation to the use of libraries and learning resources centers, including the special book and nonbook features of the OSU library, basic materials and services.

3023 Management of School Libraries and Learning Resources Centers. Introduction to practical problems in the management of library learning resources centers throughout the state, regional and national standards; understanding of the routines, methods and records necessary for the daily operations 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.

3051 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, storage and field experience credits are available for 1-3 credit hours.

4113* Reference Materials. Selection, evaluation and use of basic reference services now 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; examination of basic bibliographic aids and reviewing media involved in book and nonbook selection; analysis and practices of annotations; oral and written evaluation of books, films, instructional materials and other media.

4313 Reading Guidance for Young People. Consideration of reading interests and style and content of books suitable for young people of junior high school to junior college age; examination and reading of books for recreational and informational use, practice in preparing book talks, annotations 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 needs and the methods of library education; specialists, teachers and others, including enrichment tours and workshop or institutes.

5013 Libraries in the Social Order. Prerequisite: consent of instructor. Libraries and the profession of librarianship; evolution of the library as a social institution; functions of the library; influence of new media; evaluation of new media and new roles on library service; survey of professional library literature; professional philosophy and ethics.

5613* Bibliography of Special Fields. Prerequisite: consent of instructor. Bibliographic literature and data banks in the humanities, silences, and social sciences; theory and underlying principles, practices, and control of descriptive and systematic bibliography; practice in preparation of subject bibliographies. Print and computer data banks.

5713 Documents and Pamphlets Material. Introduction to the most-used governmental publications and indexes; selection, acquisition and care of pamphlet materials.

MANAGEMENT (MGMT)

3013 Management. Prerequisites: completion of 50 credit hours and ACCT 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.

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.

3123 Organizational Behavior and Management. Prerequisites: 3013, and SOC 1113 or PSYCH 1113. Behavioral science concepts relevant to the study of organizational and managerial behavior. Provides an understanding of the structure and dynamics of organizational behavior essential to any manager. Managerial applications stressed.

3313 Human Resource Management. Prerequisite: 3013. Policies and practices used in personnel management. Focuses upon the functions of a human resource management department.

4123 Labor Management Relations. Prerequisite: 3013. Labor relations and collective bargaining. Negotiation and administration of labor agreements and employee relations in nonunion organizations. Modes of impasse resolution.

4133 Compensation Administration. Prerequisites: 3313, STAT 2023. Introductory course. Fundamentals of compensation such as the legislative environment, compensation theories, job analysis, job evaluation, wage structures and indirect compensation programs.

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.

4613* International Management. Prerequisite: 3013. Survey of the organization, planning and management of international operations of business firms. Exploration of major cultural, economic and political systems, and their effects on the management function.

4713* Conflict Resolution In Industry. Prerequisite: 3013. An integrated and interdisciplinary approach to the issues of industrial conflict and conflict resolution. An analytical development stressing both theory and empirical research. Models of conflict; conflict between the individual, the group and the organization; economic conflict and industrial conflict.

4813* Advanced Human Resource Management. Prerequisite: 3313. Management of human resources at the organization level including employee relations laws related to human resource planning.


5123 Organizational Design and Research. Prerequisite: 5113 or 5213. An analysis of research which integrates theories of design of organizations. Reviews empirical research findings and stresses methods of organizational analysis; design and modification of organizations.
MANAGEMENT SCIENCE AND INFORMATION SYSTEMS (MSIS)

2103 Business Computer Concepts and Applications. Prerequisite: 2103 or COMSC 2113 or equivalent. Computer concepts, terminology, and software applications. Overview of hardware and software components, file structures, management information systems, futures trends, database management systems, systems analysis and design, and data communications. Introduction to database, spreadsheet, and word processing software packages and application programming.

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, report writing, magnetic tape and disk file handling.

3223 Production and Operations Management. Prerequisite: 3013. Production and operations management utilizing management decision-making techniques and their application to problems in production and operations management. Examples of applicable techniques include linear programming and decision analysis.

3233 Management Science Methods. Prerequisite: 3223. Deterministic operations research techniques applied to the problems encountered in decision making. Linear programming encountered in accounting, marketing, finance, economics, and management. Linear programming and network models.

3243 Managerial Decision Theory. Prerequisite: 3223. Decision processes under risk and uncertainty. The use of models in business decision making with outcomes governed by probability distributions. Bayesian decision analysis, utility measurements, game theory, Markov chains, queueing, simulation probabilistic forecasting and inventory, network models, and dynamic programming.

3303 Business Systems Analysis. Prerequisite: 2103, 3101, ACCTG 2203. Systems analysis as a profession and 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 designs, and program specifications. Information concerning operational and reporting activities and transition into system analysis and design.

4113 Management of Information Processing. Prerequisite: 2103 or equivalent. Managerial problems related to the effective management of information processing. Conducting feasibility studies, contracting for hardware, software and services, information-processing alternatives for the small businessman.

4203 Advanced Computer Programming for Business. Prerequisite: GENAD 3103. Advanced programming features are examined with an emphasis on the development of computer programs for business application. File processing including handling sequential files, disk-indexed sequential files, and virtual storage applications are an integral part of the course. Subjects and techniques such as TSO, segmented debugging tools and procedures, and pertinent JCL are also studied and applied.

4223 Management Information Systems. Prerequisite: 3223 and an introductory course in computing. Design, operation and implementation of computer-based information systems. Decision making: current developments in management information theory. Value of information, data bases, decision support systems, interactive languages and statistical software; and applications to managerial problems in marketing, manufacturing, and finance.

4253 Data Base Management. Prerequisite: 4223. Theoretical aspects and management applications of data bases, file organization, and data models, with emphasis on hierarchical network and relational structures, selection of storage devices, data base administration, and the analysis, design and implementation of data base management systems.

4413 Management Systems Applications. Prerequisites: 3233 and a course in a scientific programming language. Development and implementation of complex computerized decision models. Mathematical requirements and a course in a scientific programming language such as FORTRAN, PL/I, or PASCAL. Discrete computer simulation using languages such as GPSS, GASP, or SLAM. Cases include queueing, layout planning and evaluation, and financial modeling.

4523 Data Communication Systems. Prerequisite: 4113 or equivalent. Management orientation to decisions necessary in the design, implementation and control of data communications. Transmission service and equipment characteristics, network design principles, data communication software and federal regulatory policy affecting data communication.

5303 Quantitative Methods in Business. Prerequisites: admission to the MBA program or consent of MBA director. Demonstrated calculus proficiency. Application of quantitative techniques to business problems. Linear programming, transportation and assignment models, goal programming, integer programming, and networks.

5313 Production Operations Management. Prerequisite: admission to the MBA program, or consent of MBA director and 5303. The management of operations in manufacturing and service organizations. Production planning, facility location and layout, inventory control, waiting line problems and simulation. Project management and quality control. Emphasis is on a management science approach.

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.

5613 Advanced Production and Operations Management. Prerequisite: graduate standing, MGMT 5313 or equivalent. Production system, including a synthesis of production and management techniques used by operations managers. A computerized management simulation game provides decision-making experience.

5623 Advanced Management Information Systems. Prerequisite: 5513, BUSAD 5110, ACCTG 5103, STAT 3013. Design and use of management information systems in businesses and other organizations. Model building, information resource management and decision support systems.

MANUFACTURING TECHNOLOGY (MFGT)

1432 Welding Processes. Lab 3. Welding processes, their basic principles, and the characteristics of physical and chemical properties that occur in welded structures. Application of oxygas, 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, surface preparation, and the techniques required to make and test welds.

3303 Advanced Machining Principles. Lab 3. Prerequisites: GENT 1102, 1222, 1103. 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, plastics, powder metallurgy, hot and cold forming, and welding. Techniques of design, application and selection.

4050 Advanced Manufacturing Problems. 1-credit, maximum 4. Prerequisite: Instructor consent. Special problems in manufacturing.

4303 Computer Integrated Manufacturing. Lab 3. Prerequisites: GENT 1103, ELE 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 AppliedRobotics and Automated Manufacturing. Lab 3. Prerequisites: PHYSC 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: 343 and MECT 4054. 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 theory 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; a marketing consideration of the contribu-

3433 Promotional Strategy. Prerequisite: 3213. Promotional policies and techniques and their application to selling problems of the firm.

3472 Professional Selling. Prerequisites: 3213, 3323, 3433. Skills to understand the professional personal selling process. Strong emphasis on the communications func-

3513 Sales Management. Prerequisite: 3213. Sales planning and control, organization of the sales department, development of personnel, 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 foun-

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 will include the use of computers 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 STAT 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.

4433 Problems in Marketing. Prerequisite: 3213. Problems in marketing. Specific topics vary from semester to semester.

4642 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 MBA 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.

5213 Services Marketing. Prerequisite: 5133. Services and service marketing with emphasis on services research and services management.

5220 Seminar in Marketing. 3 credits, maximum 9. Prerequisite: 5133. Seminar 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.

5413 Advanced Marketing Research. Prerequisite: 5313. Introduction to the latest empirical marketing research techniques. Data collection and analysis techniques such as conjoint analysis, multidimensional scaling, path analysis, and structural equations modeling (via LISREL).

5513 Seminar in Marketing Theory. Prerequisite: 5133 or consent of instructor. Development of an evaluation of marketing theory.

5613 International Marketing Strategy. Prerequisite: 5133. An analysis of marketing in the global environment. Environmental effects on international marketing management and corporate strategy decisions.
4333 Principles of Teaching Business Management and Ownership. Prerequisites of management and ownership techniques appropriate for teaching these skills at the secondary school level.

4470 Teaching Practicum in Occupational Education. 1-12 credits, maximum 12. Prerequisites: 3253, 4103, and/or concurrent enrollment in 3453; full admission to Teacher Education. Organized teaching experiences under the guidance and direction of a local school cooperating teacher and a university teacher educator. Participant is assigned to cooperate with a cooperating teacher with responsibility for planning, implementing, and evaluating the classroom, laboratory, or shop. Same course as OAE 4470.

5000* Thesis. 1-6 credits, maximum 6. Prerequisite: consent of department head.

5220* Seminar. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Designed to develop technical marketing competencies needed by the marketing education teacher-coordinator to direct learning experiences needed in a general or specialized marketing education program such as fashion marketing, recreation and tourism, hotel and lodging or transportation.

5330 Field Problems in Marketing Education. 1-6 credits, maximum 6. Prerequisite: consent of department. Problems related to the cooperative and simulated project method of instruction.

5660 Marketing Education Workshop. 1-2 credits, maximum 6. Prerequisite: experience as teacher-coordinator or consent of department head. Intensive study of instructional, supervisory and administrative problems in marketing education.

5810* Improvement of Instruction in Merchandising. Prerequisite: consent of department head. Designed to develop the instructional competencies needed by a merchandising teacher. Fulfills one of the requirements of a general or specialized marketing education program.

MATH 5770 Seminar in Communications Media. 1-3 credits, maximum 9. Prerequisite: graduate standing or consent of instructor. International communication, media history, legal research, new technology, women and the media, television and children, industrial television, and communication research.

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 as it 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 operations of algebra, rational expressions, exponents and roots, quadratic equations, logarithms. Credit does not count for college 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 0123. Quadratic equations, functions and graphs, inequalities, systems 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.

1513 (A) Trigonometry. Prerequisite: 1513 or equivalent or concurrent enrollment. Trigonometric functions, logarithms, solution of triangles and applications to physical sciences. No credit for those with prior credit in 1715 or any course for which 1513 is a prerequisite.

1715 (A) College Algebra and Trigonometry. Prerequisites: one unit of high school plane geometry, and 0123 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 1513 is a prerequisite.

2203 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 multivariate calculus, series and applications.

2413 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. Functions and graphs, differentiation and integration with applications.

2383 Calculus for Technology Programs II. Prerequisite: 2413. 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.


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.

2910 Special Studies. 1-3 credits, maximum 6. Prerequisite: consent of instructor. Special subjects in mathematics.

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: 2003 or 3113. A continuation of MATH 2203, algebraic structure, combinatorics, finite state machines, machine decomposition, 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 Essential 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. Consideration 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. Fundamentals of plane geometry, geometric motion (translation, rotation, reflections), polyhedra, applications to measurements.

4013* Engineering Mathematics: Calculus of Several Variables. Prerequisites: 2213 and 3113. Differential and integral calculus of functions of several variables, vector analysis, other basic methods of analysis and applications.

4033 History of Mathematics. Prerequisite: 2265. Early development of mathematics as a science, contributions of Greek mathematicians, 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, distance, measure, 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.
Mathematics 205

5423* Theory of Numbers. Prerequisite: 3113. Divisibility of integers, congruences, quadratic residues, distribution of primes, continued fractions and the theory of ideals.

4253* Numerical Mathematics: Analysis. Prerequisites: 2163, 3013, knowledge of FORTRAN. Computer arithmetic and rounding errors, numerical methods and error analysis associated with interpolation, least square approximation, roots of equations, integration, finite differences and ordinary differential equations, systems of linear algebraic equations. Same course as COMSC 4253.

4273* Combinatorial Mathematics. Prerequisite: 2265. Counting techniques, generating functions, difference equations and recurrence relations, introduction to graph and network theory.


4363* Advanced Calculus II. Prerequisite: 4353. Continuation of 4353. A theoretical treatment of integration and of functions of several variables.

4553 Linear and Nonlinear Programming. Prerequisite: 4013 or 4353. Linear programming, simplex methods, duality, sensitivity analysis, integer programming and nonlinear programming.

4583* Introduction to Mathematical Modeling. Prerequisite: 2385. Techniques of problem solving and mathematical models presented by examples and case-studies of real life applications of mathematical modeling from industrial settings.


4673* Complex Analysis. Prerequisites: 4013 or 4353. Complex variables for students in engineering and the physical sciences. Analytic functions, power series, residues and poles and conformal mapping. Applications.

4710 Honors Seminar. 1-3 credits, maximum 9. Prerequisite: 400-410-420 standing of honor student. Special subject matter areas and reports on current literature.

4910* Special Studies. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Special subjects in mathematics.

4993 Senior Honors Thesis. Prerequisites: senior standing and Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a faculty member and including a public presentation. Required for graduation with departmental honors in mathematics.

600 Research and Thesis. 1-6 credits, maximum 6. Conferences and guidance in reading and research and in the writing of reports and thesis.

6010 Seminar In Mathematics. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Topics in mathematics.

5113* Intermediate Probability Theory. Prerequisites: 4363 and STAT 4113. Measure theoretical presentation of probability distributions and cumulative distribution functions, sampling theory, hypothesis testing, confidence intervals and the central limit theorem. Same course as STAT 5113.

5123* Advanced Linear Algebra. Prerequisite: 3013. Linear transformations; determinants, eigenvalues and similarity transformations; canonical forms; bilinear and quadratic forms; orthogonal and unitary transformations.

5133* Stochastic Processes. Prerequisites: 2613 and STAT 4113. Definition of stochastic processes, probability structure and conditional probability of sample functions, stationary processes and their spectral analysis, renewal processes, counting analysis, renewal processes, counting processes, discrete and continuous Markov chains, birth and death processes, exponential model, queueing theory. Same course as INDEN 5133 and STAT 5113.

5143* Theory of Functions of a Real Variable I. Prerequisite: 4363. Lebesgue measure theory, sequences of functions and the Lebesgue integral.

5153* Theory of Functions of a Real Variable II. Prerequisite: 5143. A general theory of measure, measurable functions and integration; introduction to metric and Banach spaces.

5173 Analytic Number Theory. Prerequisite: 4673 or 5383. Arithmetic functions, Zeta and L functions, distribution of primes, introduction to modular forms.

5183 Algebraic Number Theory. Prerequisite: 4113. Number fields, ideal theory, units, decomposition of primes in quadratic and cyclotomic fields, introduction to local fields.

5213 Fourier Analysis. Prerequisite: 4013 or 4353. Fourier series and integrals and boundary value problems. Applications.

5243 Ordinary Differential Equations I. Prerequisite: 4363 or consent of instructor. Existence and uniqueness of solutions, linear systems and their asymptotic behavior, oscillation and comparison and singularities.

5253 Ordinary Differential Equations II. Prerequisite: 5243. Stability and asymptotic behavior of nonlinear systems, perturbation and the Poincare-Bendixon theory for planar autonomous systems.

5303 General Topology. Prerequisite: 3113 or consent of instructor. Topological spaces including continuous functions, compactness, separation properties, connectedness and metric spaces.

5313 Geometric Topology. Prerequisite: 5303. General topological spaces including convergence, product and uniform spaces, metrization, compactness and uniform spaces.

5323 Algebra I. Prerequisites: 4113, and 5123 or consent of instructor. Group, ring and module theory to include products, co-products and ideal theory. An introduction to homological algebra, hom and tensor functors. Field extensions and Galois theory. Selected topics.

5333 Algebra II. Prerequisite: 5323. A continuation of 5323.

5383 Theory of Functions of a Complex Variable I. Prerequisite: 4353. Basic topology of the plane, functions of a complex variable, analytic functions, transformations, infinite series, integration and conformal mapping.

5393 Theory of Functions of a Complex Variable II. Prerequisite: 5383. A continuation of 5383.

5413* Differential Geometry. Prerequisites: 4013 or 4353. Differential geometry of curves and surfaces.

5513* Numerical Analysis I. Prerequisite: 4253 or COMSC 4253. Algorithms and error analysis, solution of equations, interpolation and approximation theory. Same course as COMSC 5513.

5543* Numerical Analysis II. Prerequisites: 4253 or COMSC 4253 and 4853. 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 COMSC 5543.

5553 Numerical Analysis III. Prerequisites: 3013, and 4253 or COMSC 4253. Theoretical and computational methods associated with matrix algebra, linear algebraic equations and algebraic eigenvalue problems. Same course as COMSC 5553.

5583* Case Studies in Applied Mathematics I. Prerequisites: 2613 and 3013. Selected mathematical problems from industry, independent problem-solving, oral presentation of solutions, and technical report writing, seminar-style format.

5593 Case Studies In Applied Mathematics II. Prerequisite: 5583 or consent of instructor. A continuation of 5583.

5563* Automata and Finite State Machines. Prerequisites: 3113 or COMSC 5313 or COMSC 5113 and COMSC 5213. 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 functions. Same course as COMSC 5653.

5663* Computability and Decidability. Effectiveness, primitive recursive, general recursive, recursive functions, equivalence of computability, definitions, decidability, recursive algorithms. Same course as COMSC 5663.


5693* Partial Differential Equations II. Prerequisite: 5683. A continuation of 5683.

5733 Algebraic Topology I. Prerequisites: 4113, 5123 and 5303; or 4113, 5303. An introduction to the homological algebra of geometric structures, including homotopy, homology and cohomology theory.

5743* Algebraic Topology II. Prerequisite: 5733. A continuation of 5733.

5813* Homological Algebra I. Prerequisite: 5333. Relative homological algebra including closed and projected lattices, resolution and derived functors, adjoint theorem, construction of projective classes in the categories of projectives, rings and modules; categories, Abelian categories.

5823* Homological Algebra II. Prerequisite: 5613. Continuation of 5813.

5883 The Calculus of Variations. Prerequisite: 4363. Determination of functions, curves and surfaces with maximum or minimum properties, fields of extremals, the Hamilton-Jacobi partial differential equation. Applications to geometry and physics.


6013* Functional Analysis I. Prerequisites: 5123, 5143 and 5303. Theory of normed linear spaces.

6113* Functional Analysis II. Prerequisite: 6013. A continuation of 6013.


6313 Potential Theory. Prerequisite: 4363. The force of gravity, fields of force, potential, the divergence theorem, properties of Newtonian potentials at points of free space and at points occupied by masses, Green's functions, the Green's theorem potential and existence theorems.

6410 Seminar and Research in Applied Mathematics. 1-3 credits, maximum 9. Prerequisites: consent of instructor and chair. Fulfillment of student's advisory committee.

6510 Seminar and Research In Analysis. 1-3 credits, maximum 9. Prerequisites: consent of instructor and chair. Fulfillment of student's advisory committee.
MECHANICAL AND AEROSPACE ENGINEERING (MAE)

3033* Mechanism Design. Prerequisite: ENGS 2122. Motion programming and analysis of machines. Kinematics of cam, gear, and plane mechanisms. Introduction to symbolic logic.

3043* Intermediate Dynamics. Prerequisites: ENGS 2122 and MATH 2613. Analysis of the kinematics and kinetics of particles, systems of particles, and rigid bodies from a Newtonian viewpoint, utilizing various vector techniques. An introduction to transient vibrations of mechanical systems and Lagrange's equations applied to mechanical systems.

3112* Measurements and Instrumentation. Lab 2. Prerequisite: ENGS 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.

3223* Thermodynamics II. Prerequisite: ENGS 2123. A continuation of ENGS 2213. Irreversibility and availability, applications of mechanical engineering 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 ENGS 3233. Power and propulsion engines utilizing a gas as the working substance. Basic thermodynamic and dynamic equations applied to gas compressor, turbine, and reciprocating compressor 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 ENGS 3233. Experimental study of fundamental processes in aerodynamics and fluid dynamics using advanced measurement techniques.


4293* Compressible Fluid Flow. Prerequisites: ENGS 3233 and MATH 2613. Gas flows in one and two dimensions; basic thermodynamic and dynamic equations, nozzle and duct flows, plane shock waves, frictional high-velocity flows and heat addition effects.

4323 Design for Manufacturability. Lab 3. Prerequisites: 3323, ENGS 3313. 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 process, parameter and design variables, in CAD/CAM.

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 or design selected by the student, or assigned by the instructor. A student who wishes to complete his master's degree under Plan II must enroll in this course.

5030 Engineering Practice. 1-12 credits, maximum 12. Prerequisites: senior or graduate standing and consent of instructor. Solution of real-life engineering design and development problems in an actual or simulated industrial environment. Projects may 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 adviser.

5043* Advanced Dynamics. Prerequisites: 3043, MATH 3013. Advanced treatment of analytical methods for rigid body motion with emphasis on multi-dimensional motion using Newtonian formulations, LaGrange's equations, Euler's equations, the Poinscot 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.

5083 Engineering Acoustics. Acoustical analysis and measurement techniques, with emphasis on design alternatives for noise and vibration control in machinery and in buildings.

5093 Numerical Engineering Analysis. Prerequisite: basic FORTRAN programming. Practical digital methods for flow, vibration, steady-state and transient solutions to lumped and distributed mechanical, fluid and thermal problems.

5203 Inviscid Fluid Mechanics. Prerequisite: ENGS 3233. Classical and analytical methods underlying the theory of the motion of an inviscid and incompressible fluid.

5223 Viscous 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: ENGS 3214 or equivalent. Basic theory of plasticity and its applications 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: ENGS 3313. Mechanical and thermal processing of materials—theory and applications. Solidification processes, solidification, and microstructural control by process modeling. Recent advances in processing including RSP, HIP and near net shape for traditional and advanced materials.

5373 Instrumentation. Lab 2. Analysis and design of instrumentation systems, laboratory experiences with electronic instrumentation and transducers, application of digital and analog integrated circuit components to measurement problems.

5403* Computer Aided Design and Analysis. Prerequisite: basic FORTRAN programming. 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 planar mechanisms. Application of inversion techniques, pole triangles, Robert’s law, overlay techniques, Euler-Story motion, Freudenstein’s equation and Kutzbach’s criterion.


5443 Lubrication, Friction and Wear. Prerequisite: ENGS 3233. Theories of lubrication, friction and wear; fundamentals of viscous 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 design; hydrodynamic squeeze theory and applications; analysis of hydrostatic bearings; gas lubrication; solid friction and theories of adhesion and abrasion; wear and theories of adhesion and abrasion.

5453 Fluid Power Control I. Prerequisite: 4053 or concurrent. Static and dynamic performance and stability of hydraulic and pneumatic control systems and components. Energy and power transfer and impedance matching considerations. Application to both open-loop 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, state-space models, design methods, 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. Competence in the engineering use of microcomputers through lectures and laboratory applications.


5533 Analysis of Structural Systems. Prerequisite: 4513. Computer-aided 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 Mechanisms. Prerequisite: 4333. Fracture processes in engineering materials including design considerations, failure avoidance and predictability. Fatigue processes and high-strength, toughness-limited materials emphasized.


5573 Corrosion Engineering. Lab 2. Prerequisite: ENGS 3313. Modern theory of corrosion and its applications in preventing or controlling corrosion damage economically and safely in service.


5623 Energy Conversion Systems. Prerequisite: ENGS 2213 or 4233. A comparative study of conventional and alternative energy conversion systems, including economic and environmental concerns.

5623* Applied Thermodynamics. First and Second Law analysis. Prediction of properties of nonideal fluids, including mixtures. Engineering applications to power systems design, solar systems, HVAC systems, waste heat recovery and underground petroleum reservoirs.

5643 Advanced Energy Resources Engineering. Application of energy systems principles to the development of present and future energy sources. Diverse topics ranging from utilization of heat in production of oil to extraction of fusional materials from sea water.


5723 Nonlinear Systems Analysis I. Prerequisite: 4053 or ECEN 4413. Failure of superposition; phase plane and phase space techniques; method of perturbations; asymptotic, orbital and structural stability; subharmonic generation; generalized approaches to nonlinear systems analysis.


5803 Advanced Thermodynamics I. Prerequisite: 3233. A rigorous examination of the fundamental principles of engineering thermodynamics; the First Law, system and substance, flow processes, Second Law availability, properties of substances, thermodynamics, 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: ENGS 3233. Advanced heat transfer analysis and design, with primary emphasis on conduction.

5873 Advanced Indoor Environmental System. Prerequisite: 4703. Heating, cooling, and ventilating systems. System design and component design, building heat transfer, 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 mechanisms and error analysis. Stability augmentation systems.

5933 Aeronautics. Prerequisites: 4063, 4283, 4523. Interaction between aerodynamic, inertial and elastic forces. Influence coefficients of modern wings. 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 turbojet, turbofan, ramjet and rocket engines. Applications of gasdynamics to the design of jet and rocket propulsion. Component matching for turbojets: 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 of the School and approval by the student’s advisory 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 of the department. Open enrollment under the supervision of a member of the faculty along lines of interest well advanced of and supported by the 5000-series courses.
Turbulent Fluid Dynamics. Prerequisite: 5233. Isotropic turbulence, turbulent wakes and jets, bound turbulent shear flows, transition, hydrodynamic stability and integral calculation methods for turbulent boundary layers.

6263* Computational Fluid Dynamics. Prerequisite: 5233. Steafunction-roticity and pressure-speed 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: 5533. Modeling of non-linear problems in solidification heat transfer, thermo-mechanical deformation and material removal plasticity and fracture. The simulations by computer methods including finite difference and finite element techniques. Experimental verification and processing parameter studies conducted in the materials processing lab. Tours of industry to provide additional processing background.

6423* Motion Programming of Space Mechanisms. Prerequisite: MATH 3013. Advanced techniques for the analysis of two- and three-dimensional mechanisms.

6453 Fluidics. Prerequisites: 5453 and 5463. Static and dynamic modeling of fluidic components for sensing, signal processing and transmission and control. Component interconnection and impedance matching problems. Synthesis of proportional, digital and analog fluid systems for a wide variety of applications.

6463 Fluid Power Control II. Prerequisite: 5453. Computer-aided analysis and design of control systems; effect of system parameters on dynamic performance and stability. Distributed parameter analysis of signal and power transmission lines. Case studies of feedback control systems used in transportation, aircraft and missiles, machine tools and power plants.

6483 Automatic Control N. Prerequisite: 5473 or ECEN 5413. Methods of formulation and solution of engineering system control problems based on optimal dynamic behavior, advanced techniques for model identification, computational solution of dynamic optimization problems. Applications include mechanical, electrical, fluid and thermal systems.

6543 Advanced Aerospace Structures. Prerequisites: 4523 and 5533. Modern methods for the design and stress analysis of composite structures. Analysis of thin-walled plate and shell structures by exact and approximate analytical methods.

6553* Advanced Solid Mechanics. General nonlinear problems of elasticity including thermal, dynamic and anisotropy effects; stresswave propagation; consideration of plasticity.

6723. Nonlinear Systems Analysis II. Prerequisite: 5723 or ECEN 5723. Advanced topics of nonlinear systems theory selected from the current literature. Topics may include nonlinear control theory, multi-input describing functions, nonlinear feedback control theory, the problem of Lure and Popov's criterion and multiparameter perturbation theory.

6813* Advanced Thermodynamics II. Prerequisite: 5803. Development of statistical models to predict the behavior of ideal solids and gases. Fundamental treatment of probability, correlation analysis, stochastic mechanics and quantum theory. Comparisons to show the superiority of statistical thermodynamics for predicting low-temperature behavior.

6843 Convection Heat Transfer. Prerequisite: 5233 or equivalent. Advanced convective heat transfer in laminar and turbulent flows, radiation and convection heat transfer, thermal conductivity problems, and inside channels. Heat transfer at high velocities, free convection boundary layers, and mass transfer.

6963 Dynamics of Space Flights. Prerequisite: MATH 2613. Propagation equations and dynamics for flight in space, development of the laws of Kepler for orbiting bodies; transfer trajectories between orbits; launch, ascent and re-entry problems.

MECHANICAL DESIGN TECHNOLOGY (MECDT)

1223 Computer-aided Drafting and Design. Lab 4. Prerequisite: GENT 1153 or equivalent. Computer-aided drafting and design for creation 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.

1913 Computer Systems for Technology. Lab 2. Introduction to microcomputers and mainframe computers. DOS operating system, file and data management, and word processing. Emphasis on solving problems common to engineering technology.

2053 Pipe Drafting. Lab 6. Prerequisite: GENT 1153 or equivalent. Design and layout of piping systems.

2113 Technical Illustration. Lab 6. 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.


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 of standards for detailing and fabrication of structural materials.

3323 Strength of Materials. Prerequisites: GENT 2323 and MATH 2373. Stress and strain and their relation to loads. Axial, torsional and bending loads, beam deflection, columns and combined stresses. Applications emphasized.

3563 Production Planning. Lab 3. Prerequisites: GENT 1103, 1153, and 1222. Basic forecasting, planning and control of industrial production.

3963 Tool Design. Lab 3. Prerequisites: GENT 1223. Basic design and development of special tools for processing engineering materials.

4003 Machine Design I. Prerequisites: 3323 COMSC 2113, and MATH 2383. Application of statistics and strength to the design of machine components. Problems of choosing materials, impact and fatigue loading.

4013 Computer-aided Design. Lab 2. Prerequisites: 2213, COMSC 2113, and GENT 2523. Advanced computer-aided drafting and design for 2D and 3D geometry, construction, dimensioning, design, and analysis. Application of CAD in mechanical, electronic and manufacturing problems.

4050 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 3352. Selected problems in design integration of drafting, analysis, materials and design 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 tools in the industrial world, basic principles of power generation, construction, and operation of internal combustion engines, turbines, electric and hydraulic motors. Laboratory practice in inspection, measurement, and comparisons of characteristics.


2133 Diesel Engines and Injection Systems. Lab 2. Prerequisite: 2113. 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. Prerequisite: MATH 1513. 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 2. 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 electronics systems by heat-sinking, free air-convection, forced-air convection and combinations. Identification of specific over-heating problems in electronics systems and the design of appropriate heat removal techniques.

3202 Transportation Problems. Prerequisite: 2113. 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 system analysis using Bernoulli and general energy equations, laminar and turbulent flows, flow and pressure measurements, flow forces, lift and drag.
LABORATORY (MTCL) 209

Microbiology 209

MECHANIZED AGRICULTURE (MECAG)

1413 Introduction to Engineering in Agriculture. Prerequisite: MATH 1513 or 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.

2204 Conservation Surveys and Technology. Lab 2. Use of the farm level; mechanical methods of erosion control including terracing and farm-pond planning.

3152 Electricity In Agriculture. Lab 2. Prerequisite: MATH 1513. Electricity applied to the farm and rural home including farmstead distribution and use and National Electrical Code requirements. 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 Metals and Welding. Lab 3. Prerequisite: 1413. Essential knowledge and theory necessary for understanding the properties of hot and cold metals and welding. Laboratory provides opportunities 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, hydraulics 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 waterways, terraces, ponds, drainage systems, erosion control facilities and water wells.

3342 Field Machinery. Prerequisite: MATH 1513, PHYS 1214. Machine measurements 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 systems. Laboratory methods of the conservation laws, fluid flow, heat transfer, refrigeration, freezing, psychrometrics, and energy conservation.

4163 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: 3223. Advanced agricultural mechanics programs for vocational agriculture and technical schools. Application of blend mechanics methods, practices and skills to advanced projects.

4222 Farm Mechanics: Organization and Methods. Lab 2. Prerequisite: 3223. Required of agricultural education majors. Organization of mechanical systems 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. The theory and laboratory study of pathogenic bacteria, viruses, rickettsiae, fungi, and parasites. Includes isolation, identification, antimicrobial susceptibility testing, and medical significance.

4125 Clinical Chemistry I. Lab 9. Prerequisite: concurrent internship in affiliated hospital and all degree requirements for B.S. in medical technology except 30 hours MTCL. The theory and laboratory methodology of biochemical analysis, clinical microcopy, routine and special procedures, and medical significance.

4236 Clinical Hematology. Lab 12. Prerequisites: concurrent internship in affiliated hospital and all degree requirements for B.S. in medical technology except 30 hours MTCL. Developmental study of diseases, causation and correlation of hematological findings with physiological conditions.

4246 Clinical Immunology. Lab 12. Prerequisites: concurrent internship in affiliated hospital and all degree requirements for B.S. in medical technology except 30 hours MTCL. Immunologic responses and procedures used in serological determinations; immunohematology, fundamentals of antigen-antibody reactions, blood groups and types, compatibility testing, blood components, and the lab methods used as they relate to the medical significance of immunology and infectious diseases.

4325 Clinical Chemistry II. Lab 9. Prerequisites: concurrent internship in affiliated hospital and all degree requirements for B.S. in medical technology except 30 hours MTCL. The theory and laboratory methodology of analytical biochemistry, instrumentation, lab mathematics, routine and special procedures and medical significance.

4351 Toxicology in Medical Technology. Prerequisites: concurrent internship in affiliated hospital and all degree requirements for B.S. in medical technology except 30 hours MTCL. The theory and laboratory methodology of analytical biochemistry, instrumentation, lab mathematics, routine and special procedures and medical significance.

4375 Toxicology in Medical Technology. Prerequisites: concurrent internship in affiliated hospital and all degree requirements for B.S. in medical technology except 30 hours MTCL. The theory and laboratory methodology of analytical biochemistry, instrumentation, lab mathematics, routine and special procedures and medical significance.

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 biogeochemical cycles and energy transfers.

3133* Genetics of Microorganisms. Prerequisites: 2124 and one year of organic chemistry. Molecular and genetic approaches to the study of microorganisms.

3143 Pathogenic Microbiology. Lab 3. Prerequisite: 2124. Examination of pathogenic bacteria as they relate to human, animal, other animals, plants and insects. Same course as PLP 3314.

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 manufacture and preservation, to food spoilage and microbial food poisoning and to various aspects of primary food production.

3254 Immunology. Lab 3. Prerequisite: 2124. Vertebrate hematology and serology. Applications of immunology and Chemistry and biology of the acquired immune response.

3264* 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 the 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 structure and function 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.

4142 Microbial Genetics Laboratory. Lab 4. Prerequisite: 3133 or concurrent enrollment. Comprehensive laboratory course in research techniques involving classical and modern methods of gene transfer and fusions.

4224 Microbial Physiology. Lab 4. Prerequisite: BIOCH 3653 or BISC 3014. The structure and function of microorganisms. Synthesis, translocation, and metabolism of cellular macromolecular constituents. Substrate transport and metabolism.

4990 Special Problems. 2-4 credits, maximum 4. Prerequisite: consent of instructor. Minor investigations in the field of microbiology.

4993 Senior Honors Project. Prerequisites: departmental invitation, senior standing. Honors program participation. A research project under the direction of a faculty member resulting in a written report to be judged by a second faculty member as well. Required for graduation with departmental honors in microbiology.

5000 Thesis or Report. 2-6 credits, maximum 6. Prerequisite: permission of major professor. A student studying for the M.S. degree enrolls in this course for 6 hours credit for the thesis option or 2 hours credit for the report option.

5103 Bioenergetics and Metabolic Pathways. The energetics of metabolic pathways and their regulatory mechanisms.

5114 Advanced Immunology and Immunchemistry. Lab 6. Prerequisite: 3524 and BIOCH 3653, or consent of instructor. Laboratory activities, in immunchemistry. Topics may include: preparation of antigens, conjugation of hapten to carriers, production of antibodies, characterization of antibodies, antibody structure and function, antibody fragmentation, antigen/antibody reactions, radioimmunoassay, antibody labelling, immunochemistry, and chemical modulation of the immune response.

5124 Advanced Immunology: Immunochemistry. Lab 6. Prerequisites: 3525 and BIOCH 3653, or consent of instructor. Advanced studies, with an emphasis on laboratory activities, in immunochemistry. Topics include: organs of the immune system, cells of the immune system, lymphocyte activation, phagocytosis, lymphokine production and function, hypersensitivity reaction, major histocompatibility complex and its modulation of immune responsiveness, transplantation immunology, tumor immunology, immunopathology, autoimmunity, and immunopharmacology.

5130 Current Topics in Immunology. 1 credit, maximum 6. Prerequisites: 3255 and consent of instructor. Discussion or current immunologic literature, with emphasis on critical analysis of research papers.

5153 Advanced Microbial Genetics. Prerequisites: 3133 or BISC 3024, BIOCH 3653 or BISC 3014, 4142 or concurrent enrollment. The structure and function of nucleic acids. Gene transfer mechanisms, genetic recombination and plasmid biology. Emphasis on recent developments in recombinant DNA technology.

5160 Seminar. 1 credit, maximum 2. Required of all graduate students majoring in microbiology.

5243 Fungal Metabolism. Prerequisites: one course in biochemistry, 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 unlike those encountered in other organisms. Same as PLP 5243.

5990 Special Problems. 1-4 credits, maximum 10. Prerequisite: permission of instructor. Investigations in the field of microbiology.

6000 Thesis. 1-15 credits, maximum 45. Prerequisite: permission of major adviser. Research in microbiology for the Ph.D. degree.


6120 Recent Advances in Microbiology. 1-3 credits, maximum 5. Prerequisite: one graduate course in biochemistry. Discussion and evaluation of recent scientific contributions in terms of the living organism.

6143 Microbial Physiology. Lab 3. Prerequisite: one graduate course in biochemistry. The chemistry and integrated functioning of microbial structures and macromolecules.

6253 Microbial Evolution. Prerequisites 2124, BIOCH 3653, BISC 3024. The mechanisms and results of microbial evolution in nature and in the laboratory, with emphasis on microbes as models for evolutionary systems and their application to eukaryotic evolution, classification and phylogeny, and discussion of protobiology and the probable fate of engineered microbes.

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.

1112 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 aspects of military life. Theory and tactics for military operations taught through classroom lecture and outdoor practical application exercises. Taught as an officer in the U.S. Army. Some laboratories will be on Saturdays by arrangement.

1114 The Platoon Leader I. Lab 2. Prerequisites: completion of lower-division MILSC or equivalent, and approval of PMS. The functional role of the platoon leader with practical work in leadership, ethics, land navigation, basic rifle marksmanship and drill and ceremony. Prepares cadets for advanced camp and eventual commissioning as an officer in the U.S. Army. Some laboratories will be on Saturdays by arrangement.

1122 The Platoon Leader II. Lab 2. Prerequisites: completion of lower-division MILSC or equivalent, and approval of PMS. Platoons 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.

1141 Advanced Summer Camp. Lab. Prerequisites: 3112 and 3223. Military training and performance as leaders for six weeks.

1143 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.

1223 Military Ethics, Justice and Professionalism. Lab 2. Prerequisites: 3113 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.

MUSIC (MUSIC)

0501 Concert and Recital Attendance. Graduation requirement for music degree or certificate candidates.


1011 Piano Class Lessons. For students with no previous experience.

1021 Piano Class Lessons.

1031 Voice Class Lessons.

1041 Voice Class Lessons.

1051 Organ Class Lessons.

1071 Single Reed Techniques. Lab 2. Methods for playing and teaching the clarinet and saxophone.

1081 Double Reed Techniques. Lab 2. Methods for playing and teaching the oboe and bassoon.


1110 Elective Organ. 1-4 credits, maximum 8.

1112 Elective Piano. 1-4 credits, maximum 8.

1130 Elective Voice. 1-4 credits, maximum 8.

1140 Elective Brass. 1-4 credits, maximum 8.

1150 Elective Strings. 1-4 credits, maximum 8.
1160 Elective Woodwinds. 1-4 credits, maximum 8.
1170 Elective Percussion. 1-4 credits, maximum 8.
1180 Secondary Organ. 1-2 credits, maximum 8.
1190 Secondary Piano. 1-2 credits, maximum 8.
1200 Secondary Voice. 1-2 credits, maximum 8.
1210 Secondary Brass. 1-4 credits, maximum 8.
1220 Secondary String. 1-2 credits, maximum 8.
1230 Secondary Woodwind. 1-2 credits, maximum 8.
1240 Secondary Percussion. 1-2 credits, maximum 8.
1250 Major Organ. 1-4 credits, maximum 8.
1260 Major Piano. 1-4 credits, maximum 8.
1270 Major Voice. 1-4 credits, maximum 8.
1280 Major Violin. 1-4 credits, maximum 8.
1290 Major Viola. 1-4 credits, maximum 8.
1300 Major Cello. 1-4 credits, maximum 8.
1310 Major Double Bass. 1-4 credits, maximum 8.
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.
1515 Sight singing and Ear Training I. Prerequisites: 2672 or successful completion of Music Theory Placement Examination. Development of skills in sight singing and aural perception. Taken concurrently with MUSIC 1533.
1533 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 Sight singing and Ear Training II. Prerequisites: 1533 and 1531. A continuation of 1531. Taken concurrently with 1543.
1543 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: 2021 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.
2551 Sight Singing and Ear Training III. Prerequisites: 1541 and 1543. Further development of skills in sight singing 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.
2561 Sight Singing and Ear Training 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,I,SpD)ntroduction 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 certification/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 certification/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 Major Tuba. 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, 2290.

3260 Major Piano. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2280.

3270 Major Voice. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2270.

3280 Major Violin. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2280.

3290 Major Viola. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2290.

3300 Major Cello. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2300.

3310 Major Double Bass. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2310.

3320 Major Guitar. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2320.

3330 Major Harp. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2330.

3340 Major Flute. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2340.

3350 Major Oboe. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2350.

3360 Major Clarinet. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2360.

3370 Major Saxophone. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2370.

3380 Major Bassoon. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2380.

3390 Major Trumpet. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2390.

3400 Major French Horn. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2400.

3410 Major Trombone. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2410.

3420 Major Euphonium. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2420.

3430 Major Tuba. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2430.

3440 Major Percussion. 1-4 credits, maximum 8. Prerequisites: upper-division examination, 2440.

3501 Pre-clinical and Laboratory Experiences in Music. Prerequisites: declared intent to pursue Teacher Education program. Observation and micro-teaching in music.

3610 University Bands I. 1-2 credits, maximum 6. Lab 3-5. Prerequisite: 4 hours of 2610.


3630 University Choral Ensembles II. 1-4 credits, maximum 6. Prerequisite: 4 hours of 2630.

3712 Basic Conducting. Principles of conducting choral and instrumental groups.

3722 Evaluation Techniques for the Ensemble Conductor. Prerequisite: 3712. Studies in diagnostic, and achievement evaluation techniques appropriate for the school musicians in ensemble situations.

3731 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.

3743 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.

3753 (H.I)History of Music To 1750. Prerequisite: 1513 and 1553, or equivalent. Aids music majors and other qualified students in understanding the musical styles, forms, schools, composers and instruments that developed in Western civilization from antiquity through the Baroque period.

3763 (H.I)History of Music From 1750. Prerequisite: 1513, 1553 or equivalent. Aids music majors and other qualified students in understanding the musical styles, forms, schools, composers and instruments that developed in Western civilization from the pre-classical period to the 20th century.

3772 Counterpoint. Prerequisites: 2563 and satisfactory upper-division examination. Analysis and application of contrapuntal techniques of the 18th century.

3782 Form and Analysis. Prerequisites: 2563 and satisfactory upper-division examination. Simple song forms, development forms, formal and harmonic analysis.

3822 Elementary Music Methods K-6. Prerequisite: 3731. Current elementary music trends, techniques, and materials. For those who will be involved with teaching elementary music grades K-6.

3842 Marching Band Methods. Prerequisite: 3731. Organizational responsibilities and charting for public school marching bands.

3901 Junior Recital. Prerequisites: junior standing and consent of major applied music teacher.

4021 Piano Class Lessons. Prerequisite: senior music major status.

4032 Voice Class Lessons. Prerequisite: senior music major status.

4100 Music Industry Internship. 1-6 credits, maximum 8. Prerequisites: 90 credit hours and minimum 2.50 GPA in all music and business courses. Directed practical experiences in an approved retail store or in a work situation related to the music industry.

4250 Major Organ. 1-6 credits, maximum 12. Prerequisite: 3250 and successful completion of recital attendance requirements.

4260 Major Piano. 1-6 credits, maximum 12. Prerequisite: 3260 and successful completion of recital attendance requirements.
4753* Advanced Music History and Literature. Prerequisite: two semesters of music history. Advanced music history and literature. Historical and stylistic analyses of musical forms and composers' techniques. Open to graduate students and advanced undergraduate students.

4810* Problems In Musical Composition. 1-2 credits, maximum 2. Prerequisites: 1543 and consent of instructor. Practical experiences in musical composition.

4840* Special Studies in Music Literature. 1-2 credits, maximum 4. Prerequisite: junior standing or consent of instructor. Survey of music literature suitable for teaching various levels in applied music.

4890* Special Studies In Music Pedagogy. 1-2 credits, maximum 4. Prerequisite: junior standing or consent of instructor. Survey of music pedagogical methods suitable for various levels and types of applied music.

4901 Senior Recital. Prerequisites: senior standing and permission of major applied music teacher.

4912 Orchestration and Arranging. Prerequisite: upper-division standing as a music major or consent of instructor. Orchestration for instrumental ensembles and arranging for choral ensembles.

4940 Student Teaching In Public School Music. Prerequisite: 3501. Directed observation, seminars, and supervised student teaching in selected elementary and secondary music programs.

4952* Music in the School Curriculum. Aims, content and motivation of the music education program in elementary and secondary schools from the standpoint of the classroom teacher, music specialist and administrator.

4962* Music Education Seminar. Research into latest developments of public school choral and instrumental music.

4972 Twentieth Century Music Theory and Literature. Prerequisites: 2563, 3762. Melodic, harmonic and rhythmic techniques in 20th Century music.

4990* Selected Studies in Music and Music Education. 1-3 credits, maximum 6. Short-term area studies in music and music education.

4993 Senior Honors Project. Prerequisites: departmental consent, senior standing. Honors program participation. A guided program in musicological research, music composition, or music performance, ending with an honors thesis. A student and a faculty member with a second faculty member to complete an examining committee. Required for graduation with departmental honors in music.

3113* Foundations of Occupational Education. Characteristics of occupational education and its development, 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, and full admission to Teacher Education. 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 micro-teaching and other actual situations. Same course as MKTED 4103. No credit for students with credit in TIED 4103.

4223* Program Planning and Development in Occupational and Adult Education. Prerequisites: 3113 and 4103. Planning and designing programs for the development of human resources. Program goals and objectives, curriculum analysis, teaching-learning theories, materials development, program resources and program and instructional evaluation.

4333* International Occupational Education. Comparison and analysis of international occupational education.

4470 Teaching Practicum in Occupational Education. 1-3 credits, maximum 6. Same course as MKTED 3470 or 3473, and/or concurrent enrollment in MKTED 3453, full admission to Teacher Education. 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 Thesis or Report. 2-10 credits, maximum 10. Prerequisite: consent of major adviser. Students studying for a master's degree may enroll in this course for a total of two credit hours if they write a report or six hours if they write a thesis. Students working on a specialist's degree may earn a maximum of 10 hours credit.

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. Understanding principles and evolving concepts in occupational and adult education. Critical analysis of educational programs and services and the resulting implications for the leadership personnel at all levels of program responsibility.

5123 Program Evaluation In Occupational and Adult Education. Prerequisite: background in a vocational area. The purpose of evaluation in occupational and adult education programs with specific attention given to the evaluation of program development in laboratory and shop instruction.

5153 Curriculum Planning in Occupational and Adult Education. Principles and procedures for curriculum planning, development and management in occupational and adult education with analyses of current trends and practices and their implications for program quality.

5203 Foundations of Adult and Continuing Education. Analyzes and critiques of contemporary adult and continuing education programs. Societal trends, issues and institutions which have influenced the development and current status of adult and continuing education. Analyses and critiques of contemporary adult and continuing education practices, analyzes of results, student clientele groups and their implications for new and existing programs in the field.

5213* Characteristics of Adult Learners. Learning patterns, interests and participation among adults in a variety of educational settings. Theories of learning and behavior modification for adults, with implications for adult and continuing education programs. Characteristics of learners, their learning opportunities and procedures for securing employment. Same course as MKTED 5213.

5223* Organization and Administration of Adult Education. Prerequisites: 5203 and 5213. Organizational procedures and administrative practices for effective planning, implementation, evaluation, coordination 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 organizational analyses of human performance problems, including surveys, interviews, records analysis, group interaction, and task analysis.

5313* History and Organization of Vocational and Technical Education. Prerequisite: graduate standing. Historical and occupational and technical education studied in depth for leadership development.

5333 Administration and Supervision of Local Occupational 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. Prerequisite: 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. Prerequisites: consent of instructor. Focuses on the methods of research, review, synthesis and interpretation with application to particular fields of occupational and adult education.

5450* 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: admission 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 workshops of various topics and lengths. Each workshop designed to meet unique or special needs of individuals concerned with occupational and adult education.

5880* Internship. 3-6 credits, maximum 6. Prerequisite: consent of instructor. Field placement outside the university with responsibility for planning, implementing and evaluating the classroom, laboratory or shop.

5912* Organization and Administration of Adult Basic Education Programs. Prerequisites: 5203 and 5213. Organizing and administering adult basic education for occupational programs.

NATURAL SCIENCE (NATSC)

5050 Report. 1-2 credits, maximum 2. Prerequisite: enrollment in program leading to M.S. in natural science. Guidance 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, and full admission to Teacher Education. Techniques and procedures used in determining needs for, and content of, training programs. Emphasizes 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.
**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 philosophical position in occupational and adult education.

**6213**

**Aging, Learning and Work.** Prerequisite: graduate standing. An analysis of the nature of adult learning and work performance and their relationships to the aging process.

**6333**

**Strategic Planning and Policy Development.** Prerequisites: 5123, 5223 or 5533, master's degree. Theoretical and practical aspects of the concepts and implementation processes. Articulation among various public and private sector organizations involved with human resource development.

**6533**

**Critical Issues in Human Resource Development.** Prerequisites: 5222 or 5533. Issues of concern to training directors and other human resource development (HRD) practitioners are researched, including managing HRD, consulting, organization, development, productivity, and managing change.

**6870**

**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 test ideas, theories and concepts learned in graduate study.

**OFFICE MANAGEMENT (OFFMG)**

**3753**

**Executive Secretarial Transcription.** Lab 2. Prerequisites: 2304 or equivalent and BUSPR 3523 (or concurrent enrollment). Transcription of executive-level dictation with exacting standards covering English usage, vocabulary, proofreading and accuracy and speed of transcription.

**3863**

**Office Procedures.** Prerequisite: BUSPR 2630. Theory and applied practice in performing 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. Prerequisite: MAT 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.

**2234**

**Petroleum Industry Pipeline Transportation and Storage.** Lab 2. Prerequisite: 1234; COMSIC 2113 (or corequisite). Sizing, construction, operation and maintenance of petroleum and gas pipeline transportation and storage systems. Liquid, gas and two-phase systems. Pumps and compressors. Corrosion control.

**2333**

**Basic Petroleum Production.** Lab 2. Prerequisites: 2304; GENT 2323 (or corequisite). Original completion of oil and gas wells. Design, sizing and selection of production equipment. Performance and interpretation of basic testing connections, oil and gas production. Solutions to routine production problems.

**3114**

**Petroleum Drilling Practices.** Lab 2. Prerequisites: 2234; GENT 2323 and 2333 (pre or corequisite). Basic well planning. casing setting depths. casing design and costs. Drill string design, Bit selection. Mud and mud circulation system requirements. Drilling and cementing practices. Well completion and selection of both components and power requirements. Drilling cost estimates.

**3223**

**011 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 application. See course conclusion with a comprehensive lease evaluation property.

**3234**

**Petroleum and Natural Gas Processing Fundamentals.** Lab 2. Prerequisites: 2234; MATH 2373; COMSIC 2113; MPT 3433 (or corequisite). Material balances, energy balances, PV commutation, and phase behavior relations 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 quantitatively and qualitatively. Distillation, absorption, dehydration, sweetening, refinery processes, instrumentation and controls.

**4050**

**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; or consent of instructor. Reservoir mechanics, reservoir fluids, flow through porous media. Petroleum and gas reservoir measurements, analyses, evaluations and predictions.

**4322**


**4334**

**Advanced Petroleum Production.** Lab 3. Prerequisites: 2333, 4224, and MECOT 3232. Remedial and workover operations on producing oil and gas wells. Analysis and design of artificial lift techniques. Well testing and problem well evaluation.

**PHILIPPINES (PHIL)**

**1013**

**(H,SpD)Philosophical Classics.** Basic works by great thinkers, including Plato, Descartes and Hume.

**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 and implicit 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 thought from the Greeks to 15th century Europe. Emphasis on Plato, Aristotle, Augustine and Aquinas.

**3213**

**(H)1Modern Philosophy.** Major philosophers and problems in Western thought from the 16th through the 18th century. Emphasis on Descartes, Hume and Kant.

**3300**

**(H)Philosophy and the Quality of Life.** 1-3 credits, maximum 3. 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.

**3313**

**19th and 20th Century Philosophy.** Major philosophers and problems in Western thought from Hegel to the present.

**3413**

**(H)Ethics.** Contemporary and classical views on the nature of moral judgment, moral value, relativism and objectivity, freedom and responsibility.

**3513**


**3533**

**(H)Philosophical Study of Marxism.** Prerequisites: 12 semester credit hours in HIST, POLSIC, and/or PHIL. The work of Marx and Engels and of selected later writers such as Kautsky, Lenin, and Gramsci.

**3613**


**3713**

**(H)Philosophy of Education.** Classical and contemporary philosophers who have systematically developed their ideas about education, including Plato, Aristotle, Rousseau, Locke and Dewey.

**3803**

**(H)Moral Issues in Business.** Ethical issues in business, such as employer-employee duties and loyalties, advertising, referential 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**


**3913**

**(H)Existentialism.** Selected writings and themes in the development of existentialism and related intellectual movements. Subjectivity, phenomenology, description, hermeneutics, freedom and value; and such writers as Kierkegaard, Nietzsche, Heidegger, Sartre, Marcel and Buber.

**3923**

**(H)Contemporary Issues in Philosophy.** Selected current controversies and recent trends in philosophy.

**3943**

**(H)Rational 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 individuals confront the fact of mortality. Dying patients, 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 objects and experiences; form, meaning and value in the arts; the function of art in society; criteria of criticism of the arts.

**4303**

**(A)Principles of Symbolic Logic.** Prerequisite: 1113 or consent of instructor. Symbolic analysis and calculus of propositions. Applications in various fields.
PHYSICS (PHYS)

1014 (N)L-General Physics. Lab. 2. Prerequisite: high school algebra and trigonometry, or MATH 1715. 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.

1114 (NL)General Physics. Lab. 2. Prerequisite: 1114, Continuation of 1114; electricity, magnetism, optics, quantum physics, atomic and nuclear structure.

2014 (L)General Physics. Lab. 2. Prerequisite: MATH 2265 or concurrent enrollment. Calculus-based introductory course for science, math and engineering majors. Mechanics, waves, heat, and thermodynamics.


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. 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. Prerequisites: 2114 or equivalent, and MATH 2613 or concurrent enrollment. Mechanics of particles, systems of particles and rigid bodies.

3113 Heat. Prerequisites: 1214 or 2114, and calculus. Thermometry, heat transfer, elementary theory of specific heat and the three laws of thermodynamics.

3213 Optics. Prerequisites: 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.

3513 Mathematical Physics. Prerequisites: 1214 or 2114, and MATH 2365. Physical applications of vectors, vector calculus and differential equations. Fourier analysis. Orbit geometry, coordinate systems and transformation of coordinates. Matrices and determinants.

3522 (L)Radioactivity and Nuclear Physics Laboratory. Lab 6. Prerequisite: 4663 or 4213 or concurrent enrollment. Basic measurement techniques in nuclear physics.

3621 (L)Laboratory II. Lab. 3. Laboratory experiments on atomic physics, electron interference, gamma ray spectroscopy, the photoelectric effect, and nuclear resonance.
4010* Special Problems. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Individual laboratory work of an advanced nature.

4113* Electricity and Magnetism. Prerequisites: 2114 and MATH 2613, or their equivalents. Electrostatic fields, magnetic fields of steady currents, induced EMFs, Maxwell's equations and introduction to electromagnetic wave theory. Vector analysis used.


4213 Introduction to Nuclear Physics. Prerequisites: 8 hours of physics and 8 hours of chemistry. For non-physics majors. Fundamentals of nuclear physics with applications to chemistry, engineering and biology.


4263* Introduction to Solid State Physics. Structure, specific heat, dielectric properties, lattice vibrations, free electron theory, band structure and superconductivity of solids.

4313* Biophysics. Prerequisites: 1214 or 2114; BISC 1403 or 4313; CHEM 3015. Application of physical concepts to biological structures and processes. Interaction of light with biological materials, effects and reactions on living systems, electrical processes of biological systems, thermodynamics, nature of biological materials and the application of physical concepts in biological instrumentation.

4413 Modern Physics II. Prerequisites: 3013 and 3713. Atomic and X-ray spectra; one-dimensional Schroedinger equation; nuclear structure; introduction to statistical mechanics and elementary quantum statistics.

4423 Mechanics II. Prerequisite: 3013. Coupled oscillators, propagation of waves in discrete and continuous media, mechanics of discrete and continuous media and acoustics.

4513* Introductory Quantum Mechanics. Prerequisite: 4423 or equivalent. Uncertainty principle, setting up Schroedinger equation (time dependent as well as time independent) and solving it for linear oscillator, hydrogen atom, periodic and other potentials.

4613 Advanced Electronics. Lab 3. Prerequisites: 2413 and 2520. Transmission lines, servomechanisms, operational amplifiers, solid state switching devices, measurement and control circuits.

4663* Radioactivity and Nuclear Physics. Prerequisite: 3313. Natural and artificial radioactivity, decay laws; absorption, detection and measurement of radiation; nuclear transformations.

4712* (L)Laboratory III. Lab 3. Laboratory experiments on electrical measurements and microcomputer applications to analysis and control of measurement for advanced individual research projects.

4812* (L)Laboratory IV. Lab 3. Continuation of advanced projects from 4712.

5960* Problems in Chemical Physics. 3-6 credits, maximum 6. 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, maximum 60. Prerequisites: admission to candidacy and permission of major professor.

6101* Advanced Graduate Seminar. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Special topics of an 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.


6213* Quantum Mechanics II. Prerequisite: 5613. Scattering theory, many-particle quantum mechanics and applications to atomic and molecular systems; degenerate and non-degenerate perturbation theory.

6513 Advanced Topics In Solid State Physics. Prerequisite: 5663 or equivalent. Interaction of radiation and matter, neutron scattering, phase transitions, magnetic resonance and cooperative phenomena.

6613* Advanced Nuclear and Particle Physics. Prerequisites: 5613, 6313. Nuclear and elementary particle interactions, resonances, and models, relativistic quantum mechanics and quantum field theory.

6713 Classical Theory of Fields. Prerequisite: 5313. Radiation theory, waveguides, scattering and dispersion relations; relativity.

PHYSIOLOGICAL SCIENCE (PHSI)

5000 Research and Thesis. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Research problems to meet the requirements of the M.S. degree.

5110* 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 influences of environmental factors upon these processes, and the application of reproductive physiology to animal production. Same course as ANS 5113.

5116* Veterinary Gross and Developmental Anatomy I. Lab 7. Prerequisite: first-year standing in the College of Veterinary Medicine or consent of instructor. Embryology and anatomy of domestic mammals using the dog as the primary model. Emphasis on the integration of developmental gross, radiographic and applied aspects of veterinary anatomy as they relate to a topographical appreciation of the living individual. Integrated lecture-dissection laboratory format. An overview of domestic bird and laboratory animal anatomy.

5125 Veterinary Histology and Cytology. Lab 5. Prerequisite: 1-3 credits, maximum 6. Prerequisite: consent of instructor. Organization and structure of cells and tissues of domestic animals.

5134 Veterinary Physiology I. Lab. 4 hours per semester. Prerequisite: first-year standing in the College of Veterinary Medicine or consent of instructor. Medical physiology of basic control mechanisms, including the autonomic nervous system, blood and cardiovascular system and respiratory and renal physiology of domestic animals.
5213* Comparative Physiology. Prerequisites: ZOOL 4264; BISC 3014 or BIoch 3653. Comparison of circulation, digestion, excretory, and nervous systems of vertebrates and invertebrates. Same course as ZOOL 5213.

5221* Cellular and Comparative Physiology Laboratory. Lab 3. Prerequisite: 5115. Advanced research techniques. Students design and carry out a research project.

5225* Veterinary Gross and Developmental Anatomy II. Lab 2. Prerequisite: 5134 or consent of instructor. Veterinary medical physiology of the renal, digestive, and neurological systems of domestic animals. Aspects of connective tissue and integumentary physiology. Behavioral traits of animals.

5245* Veterinary Metabolism and Nutrition. Lab 2. Prerequisite: first-year standing in the College of Veterinary Medicine or consent of instructor. Functional metabolism in domestic animals. Metabolic disorders using certain diseases as models. Veterinary nutrition and the application of these principles in the prevention and treatment of diseases of animals.

5333* Veterinary Endocrinology and Reproduction. Two 2-hour labs and one 4-hour lab. Prerequisite: second-year standing in the College of Veterinary Medicine. Functions of the endocrine and reproductive systems of domestic animals.

5353* Veterinary Pharmacology I. Four 4-hour labs. Prerequisite: 5235. Introduces the principles of absorption, distribution, metabolism and elimination of therapeutic drugs as well as the mode of action, contraindications and toxicities of antimicrobial agents and general anesthetics.

5434* Veterinary Pharmacology II. Lab. 8 hours per semester. Prerequisite: 5353 or consent of instructor. A continuation of PHSI 5353 that includes the mode of action, toxicities and contraindications of corticosteroids, anticoagulants, antispasmodics, sedatives, tranquilizers, anticonvulsants, analgesics, antimeningitis drugs, diuretics, cardiotonic, bronchodilators, local anesthetics and antihypertensive agents. In-depth focus on the problems associated with the application of pharmacological principles in the clinical setting including consideration of dose, dose form, dosing interval, rate of administration, drug interactions and toxic manifestations of chemical agents.

5472 Rumens Physiology. Prerequisite: ANSI 3653. Physiology and development of the ruminant digestive tract. Same course as ANSI 5472.

600* Research and Thesis. 1-15 credits, maximum 50. Prerequisite: 15 credits 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, endocrine and neuroendocrine physiology. Each part of this sequential course may be taken for two credits, maximum 10. Prerequisites: fourth-year standing in College of Veterinary Medicine or consent of instructor. A continuation of ZOOL 5125 with emphasis on the integration of developmental gross, histological and functional anatomy. An introduction to the principles of mammals and imaging for diagnostic and techniques for printing and preparation of electron micrographs for publication.

6120 Advanced Physiology of Reproduction. Lab 3. Prerequisite: 5134 or equivalent. Selected aspects of mammalian anatomy, physiology of reproduction and laboratory animals: consideration of infertility. Emphasis placed on current literature.

6220 Veterinary Surgical Anatomy. Lab 3-4 hours credit. Lab 3. Gross anatomy of special areas related to surgical diagnosis and treatment.

6223* Advanced Veterinary Physiology. Lab 3. Prerequisite: 5235 or equivalent. Selected aspects of the veterinary physiology of reproduction and domestic and laboratory animals: consideration of infertility. Emphasis placed on current literature.

6235 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: 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.


6550* Veterinary Anatomical Problems. 1-3 hours credit, maximum 12. Lab 3-9. Prerequisite: consent of instructor. Animal problem in gross, developmental or histologic anatomy.

6564* Veterinary Toxicology. 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.

660 Seminar. 1-6 credits, maximum 6. Consideration of literature and research problems pertaining to physiology and pharmacology.

6701* Veterinary Physiological Science Topics. Lab 1. Prerequisites: fourth-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 Comparative Regional Anatomy. 1-3 hours credit, maximum 12. Lab 3-9. Comparative study of limited parts or regions of the bodies of animals.


6900 Undergraduate Research. 1-3 credits, maximum 3. Prerequisite: consent of instructor. Undergraduate research problems in plant pathology.

5000 Research. 1-6 credits, maximum 6. Research for the M.S. degree.

5602 Plant Pathology. Lab 3. Prerequisite: 3344 or concurrent enrollment. General morphology, taxonomy and biometrics of nonparasitic and plant parasitic nematodes. Plant parasitic nematode assay techniques, subfamily identification, symptomology, pathogenicity and control.

5014 Plant Virology. Lab 4. Prerequisites: 3344 and one course in plant physiology or biochemistry. Transmission, characterization, differentiation, replication and control of plant viruses. Methods of investigating plant viruses.

5043* Plant Pathology. Lab. 4. Prerequisite: BISC 1403. Principles of plant pathology: disease development, spread and control of fungal, bacterial, viral, nematode and environmental diseases. For advanced, special, and non-plant pathology graduate students.


5243* Fungal Metabolism. Prerequisites: one course in biochemistry, 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 unlike those normally encountered in other organisms. Same as MICRO 5243.

5304 Phytopathology. Lab. 4. Prerequisite: 3344. Bacteriology as plant pathogens, with examination of the taxonomy, genetics, ecology, physiology, host-parasite interaction and control of phytopathogens.

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* Mycology 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 5340 or equivalent and a general course in genetics. Mating systems, parasexuality, mutagenesis, and gene mapping of fungi. Involvement of these topics in plant pathology.
POLITICAL SCIENCE (POLSC)

1010 Studies in American Government. 1-2 credits, maximum 2. Special study in American government to allow transfer students to fulfill general education requirements as established by Regents’ policy.


2033 (S)Introduction to Public Administration. Public administration, including administration, administrative organization, decision making, governmental public relations, and administrative responsibilities.

2043 (I)Introduction to International Politics. Structure and function of the international system focusing on the interrelationships among states, international bodies and critical issues.

2111 Parliamentary Procedure. Rules of procedure which permit assemblies of all kinds to deliberate rationally on proposals put before them and to arrive at reasonable decisions.

2113 (S)Comparative Politics. A comparative study of the political processes and institutions of contemporary societies. Introduction to the concepts and methods of comparative politics.

2993 Honors Tutorial In Political Science. Prerequisites: 1013, honors standing, and permission by head of department. For the special needs of the sophomore-level honors student majoring in political science who wishes to study individualized topics at an accelerated pace in a tutorial format. After mastering basic principles in an area of interest the student will conduct independent research under close faculty supervision and prepare a report or reports.

3003 (I,S)The Soviet Union: History, Society and Culture. 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 undergraduates. Same course as HIST 355 and 3003.

3013* (I,S)International Relations. Political dynamics and machinery of international relations with emphasis on nationalism, imperialism, self-help, collective security and foreign policy formulation and execution.

3023 (I)International Communications and Foreign Affairs. Theory and practice of international communications. The role of information media in the foreign policy of domestic, totalitarian and emerging states; the United Nations information service.

3033 International Law. The nature and scope of public international law, with emphasis on problems related to the recognition of states and governments, jurisdiction over nationals and aliens, and state responsibility in cases of expropriation and revolutionary damage.

3113 (I)Governments of Germany and Italy. Political processes and governmental institutions of major European states, with emphasis on Germany and Italy.

3123 (I)Governments of the U.S.S.R. and Eastern Europe. Political processes and governmental institutions of major European states, with emphasis on Great Britain and France.

3133* (I)Governments of Britain and France. Political processes and governmental institutions of major European states, with emphasis on Great Britain and France.

3173* (I)Politics and Administration in Mexico, Central America and Caribbean. Governmental institutions, administrative processes and contemporary trends in the politics of Mexico, Central America and the Caribbean.

3183* (I)Politics and Administration in South Asia. Political processes, governmental institutions and administration in India, Pakistan, Bangladesh, Ceylon and Nepal. Primary attention given to India.

3213 (I)Politics and Administration in South Asia. Political processes, governmental institutions and administration in India, Pakistan, Bangladesh, Ceylon and Nepal. Primary attention given to India.

3223 (I)Politics and Administration in East Asia. Political processes, governmental institutions and administration in China, Japan and Korea.

3253 (I)Politics and Governments of Africa. Political processes and governmental institutions of selected African countries.

3313 (I)Governments and Politics in the Middle East. Analysis of political institutions and processes with emphasis on selected countries of the Middle East: the social and economic basis of politics; nationalism, political development and factors of instability and change.

3353 Parties and Interest Groups. Political parties and interest groups as institutions; their role in elections and government.

3413 Public Opinion, Mass Media and Campaigns. The formation and measurement of public opinion, its interaction with the mass media, and consequent effects on campaigns.

3423 Voting and Elections. Electoral systems and their relationship to political development, political socialization, issue emergence, voting patterns, and electoral cycles.

3453 (S)The Legislative Process. The process of legislation at both the national and state levels of government in the United States and in other nations. Special attention paid to legislative leadership, organization and role of the legislative in the political system.

3483* (S)The American Presidency. The politics of presidential selection, removal and succession; formal and informal powers of the President; relations with Congress, the national judiciary and national executive branch; political reforms and the vice-presidency.

3493 Public Policy. Prerequisite: any one of 1013, 2033, 2113, ECON 1113, 2123, SOC 1113, PHIL 2113. Identification of policy problems and issues, political processes, and government formation, and examination of policies and rationales underlying governmental programs.

3613* State and Local Government. Political processes, government and administration of American states, cities and counties; special emphasis on Oklahoma.

3663 (H)Political Thought. The teachings of the three lasting traditions of Western political thought: classical, Christian, and modern.

3863 (H)Environmental Policy. An introduction to current environmental policies and law.

3873 (H)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 political developments in American political thought.

4013 (I)American Foreign Policy. Major problems and political processes of foreign relations since World War II and description of foreign formulation and aid administration.

4063 (I)World Politics. Foreign policies of major powers, areas of tension and sources of international conflict.

4100 Problems of Government, Politics and Public Policy. 1-4 credits, maximum 6. Prerequisite: 60 credit hours, or 45 hours with GPA of 3.25, including 1013. Special problem areas of government, politics and public policy concentrating on topics not covered in other Departmental course offerings.

4113 (I)International Organizations. The organization, procedures, functions and role of international institutions, with emphasis upon the United Nations and related agencies.

4213 Legal Problems of the International Environment. A case survey of diverse areas in which international law finds applicability: problems of territorial jurisdiction, continental shelves, straits, canals and international river systems, maritime law, national and outer space law and the international law of pollution.

4313 Jurisprudence and Criminal Justice. An introduction to theoretical issues of public law and law enforcement, with emphasis upon criminal justice.

4353 Administrative Law. Legal powers, limits, and procedures of administrative agencies with emphasis on federal and state administrative procedure acts.

4363 Environmental Law and Administration. Statutory law, case law, and administrative practices relating to regulation of the environment including environmental impact statements, pollution, public lands, and preservation law.

4403* Urban Politics. Problems of governing American metropolitan areas.

4413 Government Budgeting. The politics, planning and administration of government budgets.

4453 Public Personnel Administration. Problems, processes and procedures of public personnel administration.

4473 Comparative Public Administration. The nature and functions of administrative administration. Theoretical concepts, influencing the political, social and cultural settings of administration and the study of specific administrative systems.

4513 (S)American Politics. Significant developments and issues in American politics, including American political behavior and political leadership.

4553 (H)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 political developments in American political science.

4593 Natural Resources and Environmental Policy. Current 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.

4593* Natural Resources and Environmental Policy. Current 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.
5410* Seminar In Comparative Politics and Government. 3 credits. Examination of contemporary theories of political behavior with emphasis on empirical studies.


5313 Intergovernmental Relations. Problems of American federal system necessitating new forms of local-state-federal relationships.

5320 Seminar in Public Budgeting and Finance. 3 credit hour. Maximum 6. Major processes and practices involved in governmental budgeting in the United States at national, state, and local level.

5330 Seminar in Public Personnel Administration. 3 credits. Maximum 6. Current practices, problems, and issues in public sector personnel administration, including merit system, civil service reform, collective bargaining, and equal opportunity and affirmative action.

5410 Seminar In Comparative Politics and Government. 3 credits. Maximum 6. Research in the political processes and governmental institutions of foreign countries.

PSYCHOLOGY (PSYCH)

5113 (N)Comparative Psychology. Prerequisite: 1113. Comparative study of behavior characteristics of selected samples of the animal kingdom from protozoa to man.

5210* Seminar In International Relations. 3 credits, maximum 6. Research on the dynamics and institutions of international politics.

5313 Seminar in Public Administration. 3 credits, maximum 6. Administration in the public sector, stressing traditional and emerging organization structures. Emphasis on awareness of administrative processes and environment that include program design and implementation and administrative accountability.

5310 Seminar in Political Behavior. 1-3 credits, maximum 6. Examination of contemporary theories of political behavior with emphasis on empirical studies.

5620 Seminar in Natural Resource Policy, Law, and Administration. 3 credits, maximum 9. Analysis of the legal and public policy aspects of environmental regulation, including special emphasis on one of three components: environmental law, administrative law, and national resource law and policy.

5710 Seminar In American Political Institutions. 1-3 credits, maximum 6. Major processes and practices at national, state, and local level.

5320 Seminar in Public Budgeting and Finance. 3 credit hour. Maximum 6. Major processes and practices involved in governmental budgeting in the United States at national, state, and local level.

Psychological principles for prevention, intervention and rehabilitation in the community model.

5353 (S)Developmental Psychology. Prerequisite: 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 AppNed Community Psychology. Lab 3. Prerequisite: 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 Freud's 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. Prerequisite: 1113, 3213 or equivalent. Cognitive processes. Thinking, problem solving, visual imagery, attention and memory search. Both theory and application emphasized.

4194 (L)Experimental Psychology. Lab 4. Prerequisites: 1113, 1123, 2313 or equivalent. Four and five additional hours in psychology. Problems, methods and applications of experimental psychology.
4993 Special Problems. 1-6 credits, 6 maximum. Prerequisite: consent of instructor. For honors students and other outstanding students. Special topics in psychology.

4990 (S)Psychology of Women. Lab 1. Prerequisite: 1113. Sex differences and the development of sex role behavior. Encompasses the psychological dynamics of gender and 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 psychologial literature reviewed with emphasis on the psychological bases of voir dire, eyewitness behavior, courtroom persuasion, and reactions to victims. Laboratory exercises conducted in a courtroom.

4183* 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 (S)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* 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, 3213. 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, 3213 and consent of instructor. For honors students and other outstanding students. Experimental or library research.

4993 Senior Honors Thesis. Prerequisites: 3213, departmental invitation, senior standing. Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a senior faculty member. Required for graduation with departmental honors in psychology.

5000 Thesis. 1-6 credits, 6 maximum. Required of all graduate students majoring in psychology and writing a thesis.

5054* Seminar In General Psychology. (Prerequisites: graduate standing in the Department of Psychology and consent of instructor. Major theories, methodologies, and substantive issues 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 Seminar in General Psychology II. Prerequisites: 5054 or consent of instructor. Continuation of PSYCH 5054.

5083 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.

5113 Psychopathology. Prerequisites: 15 credit hours of psychology, graduate standing in the Department of Psychology or consent of instructor. Principles of diagnosis and treatment of major disorders.

5124 Psychology Workshop. 2-6 credits, 6 maximum. Provides an opportunity to study specific psychological problems, both applied and theoretical.

5133* Minority Issues. Prerequisite: six credit hours of psychology and consent of instructor. Social issues related to pluralism with emphasis on community and social psychology.

5143 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.

5153 Individual Mental Tests. Prerequisites: 3443, 4813; graduate standing in the clinical program of the Department of Psychology, the doctoral school or counseling psychology program or the psychometry program, or consent of instructor. Practice in understanding, administering and interpreting the Stanford-Binet, WASI, WISC-R and other mental tests.

5173* Child Psychopathology and Treatment. Prerequisites: 3443, 3563 or equivalent; graduate standing in the clinical program of the Department of Psychology, the doctoral school psychology program or the psychometry program, or consent of instructor. Clinical positions and issues in child psychopathology. Procedures used in the treatment of psychological disorders of children.

5253 Seminar in Human Development. Prerequisite: consent of instructor. Behavioral aspects of development from the prenatal period to senescence. Normal development contrasted to exceptional development.

5263 Personality Theories. Prerequisites: nine credit hours of psychology and consent of instructor. Various theories of personality.

5283 Community Psychology. Prerequisite: consent of instructor. Positive rehabilitative and preventive objectives; application of psychological knowledge and skills to problems of social change and general improvement of the quality of life. Physical, psychological and social factors viewed through system analysis.

5303 Quantitative Methods in Psychology I. Prerequisite: 2313. Statistical methods of evaluating research hypotheses in psychology. Descriptive measures, Student’s t, one-way analysis of variance, comparisons among groups and statistical robustness are stressed.

5313* Quantitative Methods In Psychology II. Prerequisite: 5303. A continuation of 5303. Higher-order analysis of variance designs, correlation and regression techniques, analysis of covariance, with emphasis on applications to psychological experimentation.

5323 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, scalogram and equal-appearing intervals scales. The application of these measurement scales to research in the behavioral and social sciences.

5353 Psychology of Motivation. Prerequisite: 3914. Outline of theory and research in human and animal motivation.

5380 Research. 1-12 credits, 12 maximum. Prerequisite: consent of instructor. Research project on some psychological problem.

5393 Verbal Processes. Consideration of task and subject variables, transfer and mediation, associative processes and verbal behavior.

5413 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.

5433 Psychology of Information 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.

5443 Behavioral Medicine. Prerequisite: graduate standing in the clinical program of 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, general intervention strategies in behavioral medicine including biofeedback, and specific consideration and intervention strategies for specific disorders.

5483 Neurobiological Psychology. Prerequisites: 3073 and 3413 or consent of instructor. Physiological, neuroanatomical, and neurochemical underpinnings of human behavior. Emphasis on effects of central nervous system systems on the bodily processes ranging from sensation to concept formation.

5513* Experimental Learning Theories. Prerequisite: nine credit hours of psychology. Basic concepts and empirical findings in animal and human learning.

5563 Advanced Social Psychology. Prerequisite: 3743. History, theory and experimentation of dynamic interactions of group membership and individual behavior.

5573 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.

5583* Developmental Psychobiology. Prerequisites: 3073 or equivalent. Focus on exploration of the biological aspects of human development, with particular emphasis on the physiological, ethological, and genetic perspectives.

5620* Seminar In Psychology. 1-9 credits, 9 maximum. Prerequisite: consent of instructor. Consideration of special topics that are particularly timely or technical in nature.

5640 Seminar and Workshop in Test Construction Techniques. Prerequisite: consent of instructor. Derivation and use of the basic equations and formulas pertaining to the measurement of individual differences on the basis of well defined collections of stimuli.

5640* Clinical Practicum. 1-12 credits, 17 maximum. Prerequisites: graduate standing in the clinical program of the Department of Psychology. Practicum experience for graduate students in the clinical psychology program.

5650* Practicum. 1-16 credits, 16 maximum. Prerequisites: graduate standing in the clinical program of the Department of Psychology. For the marriage and family practicum only, doctoral level counseling psychology students may also enroll. 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.

5673 Teaching Practicum. 1-2 credits, 2 maximum. Prerequisite: consent of instructor. Primarily for graduate students with well defined new teaching responsibilities.

5713 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.

5723 Child Diagnostic Methods. Prerequisites: 5153, 5173; graduate standing in the clinical program in the Department of Psychology or the doctoral school psychology program, or consent of instructor. Administration and interpretation of diagnostic instruments used specifically with children.
Religious Studies

5753 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 of speech and language. Laboratory techniques and diagnostic evaluation of psychological requirements for the Doctor of Philosophy degree. Supervised clinical experience under the direction of a qualified clinical psychologist in mental health settings.

6000 Internship in Mental Health. 1-6 credits, maximum 6. Prerequisite: enrollment in mental health specialist program (M.S. option). Supervised clinical experience under the direction of a qualified clinical psychologist in mental health settings.

6223 Research Design. Prerequisites: 3914, 5323, and doctoral level standing. Experimental techniques in psychophysiology, sensory processes, perception, motivation and emotion, and learning and memory.

6233 Computer Applications in Psychology. Prerequisites: 5303 and 5313. Organizing experimental data for computer-assisted analysis. Emphasis on problems peculiar to within-subjects experiments used in psychology. Selection, modification and creation of data analysis programs. A thorough knowledge of statistical techniques is assumed.

6283* Factor Analysis. Factor analysis and implications for measurement of mental abilities, personality traits and learning.

6313 Systems of Psychotherapy. Prerequisites: 5113; graduate standing in the clinical program of the Department of Psychology or consent of instructor. Major therapeutic techniques and philosophical and medical schools and their contribution to modern thought. Emphasis on the interpersonal, social, community and preventative interventions.

6393* Psychology of Language. Review of data and theories on the nature of language. Laboratory techniques and experimental designs will also be reviewed to emphasize understanding of psycholinguistic research.

6513 Group Treatment Methods. Prerequisites: 5113; 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.

6523 Family Treatment Methods. 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.

6553 Advanced Practice in Marital and Family Treatment. Prerequisites: 6523, concurrent enrollment in counseling or clinical practicum; graduate standing in the clinical program of the Department of Psychology or the doctorate counseling psychology program, or consent of instructor. Advanced methods in assessment, diagnosis and treatment of marital and family problems. Skills in development, professionalism, ethics and case management. Dynamics of co-therapy and conjoint treatment.

6643 Psychopharmacology. Prerequisites: 3073 or 5054, consent of instructor. A comprehensive course dealing with the various classes of drugs that affect the central nervous system. Primary focus is on clinical research with humans. Covers topics ranging from drug-receptor interactions through substance abuse and behavioral disorders.

6673 Neuropsychological Assessment. Prerequisites: 5054 or 5033, and 5113, 4756, 5783; graduate standing in the clinical program in the Department of Psychology or consent of instructor. Psychometric assessment of the effects of cerebral damage or disease.

6933 Communication and Persuasion. Seminar concerning the communication process at all levels from face-to-face encounters to the mass media with emphasis on the social and psychological factors that influence persuasive attempts.

RELGIOUS STUDIES (REL)

1103 (H) The Religions of Mankind. Major world religions such as Hinduism, Buddhism, Judaism, Christianity and Islam with 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 Introduction to the Old Testament. The writings of the Hebrew Scriptures with emphasis upon historical background, critical analysis and theological interpretation.


2513 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.


3223 (H) The Teachings of Jesus in Historical Context. Emphasis on interpreting selected passages from the Gospels.

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.

3283 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 religious and philosophical ideas 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 (H) The Islamic Tradition. Recommended: 1103. An introduction to Islam, providing an historical survey up to the modern period, with emphasis on the Quran, the prophet Muhammad and major aspects of Muslim thought and civilization.

3673 (H) The Religions of Native Americans. Recommended: 1103. Selected tribal worldviews, belief systems and religious ceremonies, as depicted in oral traditions, songs and literature. Emphasis on Northern and Southern Plains Indians.


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 an historical period will be studied to discover what humans are expressing of religious significance. Selected periods will be chosen from the Renaissance to the present.

3713 (H) Religion, Culture and Society. Recommended: 1103, ANTH 2353, SOC 1113. 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 SOC 3713.


3853 (H) Ethical Issues in Biology and Medicine. Medical 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 patients, the ethical issues of euthanasia and suicide, the prolongation of life and the art and philosophy of 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 studies, seminars and courses on selected topics in religion.

4113 (H) The World of Islam: Cultural Perspectives. The cultural heritage of the world of Islam explored through its interaction in art, architecture and literature of the Muslim peoples.

4330 Seminar in Biblical Studies. 3 hours credit, maximum 6. Restricted to students with two course 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.
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.

2115
(H)Intermediate Russian I. Prerequisite: 1225 or equivalent. Continuation of 1225. Russian grammar, composition and conversation.

2225
(H) Intermediate Russian II. Prerequisite: 2225 or equivalent. Continuation of 2225. Readings in English. Soviet literature from mid-19th Century to present: Russian and Ukrainian. Readings in English. Classes conducted in English.

3123

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.

3323
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. May be taken before RUSS 3113.

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. May be taken before RUSS 3113.

3113
(H)Russian Literature in Translation I. Russian literature from its beginning to mid-19th Century: Pushkin, Lermontov, Gogol, Turgenev and Dostoevsky. Readings in English. Classes conducted in English.

3113
(H)Russian Literature in Translation I. Russian literature from its beginning to mid-19th Century: Pushkin, Lermontov, Gogol, Turgenev and Dostoevsky. Readings in English. Classes conducted in English.

3233
Such problems of Aging, including the analysis of the behavior of the aged within the framework of social institutions.

3233
Such problems of Aging, including the analysis of the behavior of the aged within the framework of social institutions.

SOCIOLOGY (SOC)

1113
Introduction to Sociology. The science of human society. Emphasis on basic concepts. Assists the student in understanding the social influences on day-to-day life.

1223
(Sp,Sd)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
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.

2993
Sociology of Racism. Sociological phenomena of racial developmental processes, problems and consequences.

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
Social Psychology. Social basis of personality development and behavior, including symbolic environment, family and group, motivation, attitudes and opinions, and social roles.

3233
Collective Behavior and Social Movements. Analyzes panics, crazes, riots and social movements emphasizing institutional and social psychological origins and consequences.

3373
The Sociology of Developing Societies. Prerequisite: one course 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 international and national agencies and the effects on the culture, social relations, and social structures of Third World countries.

3423

3523

3713
Religion, Culture and Society. Recommended: 1113, ANTH 2353, REL 1103. An introduction to the scientific study of religion. Religious activity in both tribal and national 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
Sociology of Death and Dying. Death and dying as social phenomena including cross-cultural perspectives. An understanding of occupations and professions dealing with terminal patients in hospitals and with funerals. Students required to engage in original research from community sources.

3883
The Field of Social Work. Prerequisites: 1113, 2123. Unique features of the profession of social work. A problem-solving framework as the basis of identifying and analyzing various individual and social problems, developing plans for problem alleviation, carrying out and monitoring the plan, and evaluation of effectiveness. Selected theoretical orientations offering practical alternatives to problem solving.

3952
Applied Sociology. Prerequisite: sociology majors or consent of instructor or adviser. Application of sociological theory and methods to various job situations.

3993
Sociology of Aging. Sociological problems of aging, including national and international behavior of the aged within the framework of social institutions.

4003
Senior Thesis in Sociology. Prerequisites: 3113, 4013. 4 credits for regular students and 5 credits for honors. A student, in consultation with a faculty advisor, prepares a research project (review literature, prepare proposal, gather and analyze data and report results) on a sociologically significant topic or issue.

4012
Qualitative and Applied Social Research Methods. Prerequisites: 3113 and STAT 4013. Conducting, analyzing and reporting qualitative social research. Research design, data collection, analysis and write-up of evaluation and social impact assessments. Individual research project included.
4773^* Social Casework Methods. Prerequisite: 3883 or con-
viewer. Methods for social work intervention with individ-
and groups, families, and communities. Concepts, techni-
and assessment methods.

4850 Internship in Sociology. 1-4 credits, maximum 4.
Prerequisites: 3952, completion of 12 hours of sociology,
or consent of internships coordinator. Field experience in
a variety of work settings.

4923^* The Field of Corrections. An overview of correctional
work focusing on probation, parole and institutions. A
survey of contemporary alternatives to conventional
imprisonment.

4953 Social Welfare as a Social Institution. Problems, skills,
and strategies involved in social welfare planning;
emphasis on improving welfare policy through pro-
gram management and macro-level social work skills.

4990 Exploration of Sociological Issues. 1-3 credits, max-
imum 6. Prerequisite: consent of instructor. Examines
topically significant issues and topics.

4993 Senior Honors Thesis. Prerequisites: departmental
invitation, senior standing, honors program participation.
Advanced reading and research program ending with an
honors thesis under the direction of a senior faculty
member, with second faculty reader and oral examina-
tion. Required for graduation with departmental honors
in sociology.

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. Emphasizes
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 descriptive 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 com-
puter programs to answer such questions.

5273 Qualitative Research Methods. Examination of ethno-
graphical studies and implementation issues con-
ected with qualitative research. Research project
required.

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 rela-
tionships.

5353^* Social Systems Analysis. Relations between proper-
ties of relatively large social systems. Emphasis on
theories relating the properties, empirical derivations of
their measures and research concerning their inter-
relations.

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. Reorganiza-
tion of prison inmates in new vocational and social skills.

5563 Community Treatment of Offenders. Prerequisite:
1-6 credits or equivalent. Treating 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.

5753 Complex Organizations. Prerequisite: six hours of
undergraduate sociology or equivalent. Nature and types of
complex organizations: organizational structure;
organizations and society; organizational changes.

5883^* Sociology of Education. Manner in which social forces
and institutions influence education and the educational
system in the United States.

5900 Internship. 1-6 credits, maximum 6. Supervised field
placement.

5990 Advanced Problems and Issues in Sociology. 1-9
credits, maximum 9. Prerequisite: consent of instructor.
Group enrollment or individual research enrollment as
needed. Graduate level analysis of special problems and
issues in sociology not covered in other Department
offered.

6000 Dissertation. 1-12 credits, maximum 18.

6110 Sociological Theory II. 2-3 credits, maximum 6. Critical
examination of significant theoretical formulations, 1920
to the present. Relation between theoretical development
and current research emphasis.

6213 The Sociology of Knowledge. Prerequisite: six hours of
undergraduate sociology or equivalent. Relationship
between human thought and the social context within
which it arises.

6260 Seminar in Current Research Literature. 2-3 credits,
maximum 6. Methodological analysis of advanced
research in major areas of sociology.

6390 Seminar In the Family. 2-3 credits, maximum 6. Inten-
sive analysis of published research in the sociology of
the family.

6420 Seminar In Urban Sociology. 2-6 credits, maximum 6.
An historical and applied approach to the complex urban
studies. Examines different methodologies for urban
community analysis.

6450 Seminar in Industrial Sociology. 2-3 credits, maximum 6.
Intensive analysis of selected problems in industrial
sociology.

6550* Seminar in Social Organization. 2-3 credits, maximum 6.
Research and literature relating to macro-social
analysis.

6650* Seminar In Social Psychology. 2-3 credits, maximum 6.
Development and critical analysis of research in social
psychology.

6750 Seminar In Deviance and Criminology. 2-3 credits,
maximum 6. Current research and theory in criminology,
penology and deviance in modern society.

6950* Seminar In Social Gerontology. 2-3 credits, maximum 6.
A theoretical and practical examination of the
sociological implications, both individual and societal,
of an aging population.

SPANISH (SPAN)

1115 (I)Elementary Spanish I. Lab 1 1/2. Pronunciation, con-
duction, grammar and reading.

1225 (I)Elementary Spanish II. Lab 1 1/2. Prerequisite: 1115,
or equivalent.

2112 (H)Intermediate Reading and Conversation I. Lab 1.
Prerequisite: 2111 or equivalent, (May have been
gained in high school.) Reading and discussion of
simple Spanish texts, mostly cultural. May be taken con-
currently with other 2000-level Spanish courses.

2113 (H)Intermediate Conversation and Composition I.
Lab 1. Prerequisite: 2225 or equivalent. (May have been
gained in high school.) Reading, vocabulary building,
composition, guided writing. May be taken con-
currently with other 2000-level Spanish courses.

2223 (H)Intermediate Reading and Conversation II. Lab 1.
Prerequisite: 2112 or equivalent. (May have been
gained in high school.) Reading and discussion of more
advanced Spanish texts, mostly literary. May be taken con-
currently with other 2000-level Spanish courses.

3220 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.

3260 (I)Advanced Conversation and Composition. 1-3
credits, maximum 3. Lab 0-6. Prerequisite: 20 credit
hours of Spanish or equivalent. Practice in composition
and stylistics, designed to bring students up to a high
level of proficiency in speaking and writing. Spanish
majors must take all three credits in one semester.

3333 (H,1)Hispanic Civilization I. Prerequisite: 20 credit
hours of Spanish or equivalent. Reading and discussion of
shorter texts outlining the development of contem-
porary Spanish civilization. Classes conducted in Spanish.

3463 (I)Advanced Diction and Phonetics. Lab 1. Prere-
quisite: 20 credit hours of Spanish or consent of in-
structor. Required course for teacher certification/licensure.
Spanish speech sounds and intonation patterns, with
practice to improve the student's pronunciation.

4110 (H)Chicano Literature and Civilization. Prerequisites:
20 credit hours of Spanish or equivalent competence.
Reading, analysis, and discussion of the most outstand-
ing works in Chicano literature produced since 1848.
Contemporary works are emphasized. Classes con-
ducted in Spanish.

4115 (H)Hispanic Drama. Prerequisite: 20 credit hours of
Spanish or equivalent competence. Reading and inter-
pretation of dramatic works selected from the Hispanic
literatures.

4220 (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. Prere-
quisite: 20 credit hours of Spanish or equivalent com-
petence. Translation of documents produced by
government agencies, universities, business and
industrial organizations. Writing of letters, memos and
correspondents.

4253 (H,I)Masterpieces of Hispanic Literature I. Prere-
quisite: 20 credit hours of Spanish or equivalent com-
petence. Translation of documents produced by
government agencies, universities, business and
industrial organizations. Writing of letters, memos and
correspondents. Spanish 4253 is not a prerequisite for this course.
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.

4710 Advanced Hispanic Studies. 1-3 credits, maximum 9. Lab TBA. Prerequisite: 22 hours of Spanish or graduate standing in foreign language.

**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 speech. 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.

3703 Small Group Communication. General systems approach to small group processes. Special consideration given to group roles, norms, leadership and decision making. Participation in various types of discussion groups.

3711 Employment Interviewing. Lab 1. Prerequisite: junior standing. Prepares student to understand, prepare for, and participate in employment interviews. Resumes, researching job opportunities and other forms of preparation for an interview.

3720 Practicum I. 1-2 credits, maximum 2. Prerequisite: speech communication major. Communication facilitation for the speech communication major, with student’s initial role as interviewee.

3723 Business and Professional Communication. Oral communication encounters in business and professional settings. The interview, interview briefing, telephone, small group interaction and informative, integrative and persuasive speeches.

3733(Elements of Persuasion. Principles and concepts of interpersonal and public persuasive encounters. The instrumental and interactive nature of persuasion. Designing and participating in actual persuasive campaigns.

3743 Advanced Public Speaking. The preparation and delivery of various types of public speeches.


4993 Senior Honors Thesis. Prerequisites: departmental invitation, senior standing, Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a faculty member. Required for graduation with departmental honors in speech communication.

5000 Research and Thesis. 1-3 credits, maximum 6. Prerequisite: approval of major professor. Research in speech and/or auditoryology.

5013 Introduction to Graduate Study. Research methods with special emphasis on those used most frequently in communication research. Professional opportunities in the various speech fields; practical experience in outlining a piece of research.

5050 Introduction to Quantitative Research in Speech. Methods and major findings of empirical research in speech.

5210 Advanced Practicum. 1-3 credits, maximum 9. Prerequisite: consent of instructor. Practical experience for advanced students on and off campus.

5710 Seminar In Speech. 1-3 credits, maximum 9. Individual and group investigations of problems in speech communication, theater, and speech pathology and audiology.

5713 Rhetorical Theory. Contemporary rhetorical theory focusing on the processes of social influence.

5723 Oral Communication Theory. Modern theories dealing with symbolic and communicative behavior.

5733 Human Relations in Organizations. The place of oral communication in decision-making in organizations. Relationship of oral communication to organizational structure, organizational needs, patterns of leadership and techniques of information collection.

5763 Seminar In Organizational Communication Consultancy. Diagnostic measures for identifying communication problems in organizations and the development of consulting or interventionist programs to solve such problems.

**SPEECH PATHOLOGY (SPATH)**


2113 Introduction to Communication Disorders. Prerequisite: 2213 (previous or concurrent enrollment) or consent of instructor. The nature, symptoms, pathology and diagnosis of major speech and language disorders. Methods and techniques utilized in the correction of speech and language disorders. Direct therapy observations.

2213 Phonetics. Prerequisite: 2213 or equivalent or concurrent enrollment. Observation of and participation in speech and language therapy activity and associated activities.


3213 Communication Disorders In the Classroom. Prerequisite: 3224. Development of consulting or interventionist programs in the classroom. Development of barriers related to the concepts of perception, attraction, self-disclosure, listening and conflict.

4516 Seminar In Speech. 1-3 credits, maximum 6. Prerequisite: departmental invitation, senior standing, Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a faculty member. Required for graduation with departmental honors in speech communication.

5763 Seminar In Organizational Communication Consultancy. Diagnostic measures for identifying communication problems in organizations and the development of consulting or interventionist programs to solve such problems.

**Approved for Graduate Credit**
499 Honors Thesis. Prerequisites: departmental invitation, senior standing. Honors program participation. A guided reading and research program ending with an honors thesis under the direction of a faculty advisor, with second faculty reader and oral examination. Required for graduation with departmental honors in speech pathology.

500 Research and Thesis. 1-3 credits, maximum 6. Prerequisite: approval of department. Research in speech and language pathology and audiology.

503 Research Methods in Communication Disorders. Prerequisite: 2113. Research methods with emphasis on the use of the research process. Elementary probability, descriptive and inferential statistics. Observational techniques used in the evaluation of speech and language disorders.


523 Clinical Audiology. Prerequisites: 3123, 4133, 4313. Hearing disorders and their etiologies. Clinical applications of pure tone and speech audiometric tests, including special diagnostic tests. Overview of rehabilitation and amplification.

513 Stuttering. Prerequisite: undergraduate speech pathology degree requirements met. Recent research into the nature, causes and treatment of stuttering.


517 Communication Problems of Children with Special Adaptive Needs. Prerequisite: 4313. Recent research in the etiology and management of communicative disorders in individuals with orofacial, physical, and visual anomalies who require specially-adapted educational intervention programs.

5210 Advanced Practicum. 1-6 credits, maximum 9. Prerequisite: consent of instructor. Practical experience for the advanced student off or on campus.

5243 Communication Disorders of School-Age Children and Adolescents. Prerequisite: 4325 or consent of instructor. Linguistic, cognitive, and pragmatic deficits of high risk-school-age children and adolescents; impact of spoken and written language deficits on academic achievement. Assessment and intervention strategies.

5251 Seminar in Diagnostic Methods. Prerequisite: 4253. Application of techniques used in the evaluation of speech and language disorders.

5263 Normal and Disordered Communication in an Aging Population. Description of normal age-related changes in communication skills and information about communication disorders which occur in aging. Strategies for dealing with problems.

5710 Special Topics In Communication Disorders. 1-4 credits, maximum 9. Prerequisite: approval of department head. Individual and group investigation of problems in speech and language pathology and audiology.

STATISTICS (STAT)

2013 (A)Elementary Statistics. Prerequisite: MATH 1513. An introductory course in the theory and methods of statistics. Descriptive measures, elementary probability, random variables, estimation, hypothesis testing, correlation and regression. There is a separate section for students in social sciences. No credit for students with credit in 2023.

2023 (A)Elementary Statistics for Business and Economics. Prerequisite: MATH 1513. Basic statistics course for undergraduate business majors. Descriptive statistics, basic probability, discrete and continuous distributions, point and interval estimation, hypothesis testing, correlation and simple linear regression. No credit for students with credit in 2013.

3003 (A)Intermediate Statistical Analysis. Prerequisite: 2023 or 2023. Applications of elementary statistics, introductory experimental design, introduction to the analysis of variance, simple and multiple linear regression, nonparametric statistics, survey sampling, time series and Bayesian analysis.

4013 (A)Statistical Methods I. Lab 2. Prerequisite: 60 credit hours including MATH 1513. Basic experimental statistics, basic probability distributions, methods of estimation, analysis of variance, covariance, correlation and linear regression, analysis of variance for data that are in a one way, a two-way crossed, or in a two-fold nested classification.

4023 (A)LStatistical Methods II. Lab 2. Prerequisite: 3013 or 4013 or 4033. Basic concepts of experimental design. Analysis of variance, covariance, split-plot design. Factorial arrangements of treatments, multiple regression in estimation and curvilinear regression, enumeration data.

4033 Engineering Statistics. Prerequisite: MATH 2365. Introduction to probability, random variables, probability distributions, estimation, confidence intervals, hypothesis testing, linear regression.

4043 Applied Regression Analysis. Prerequisite: one of 4013, 4033, 5013 or equivalent. Matrix algebra, simple linear regression, residual analysis techniques, multiple regression, nonlinear regression, dummy variables, influence statistics.

4053 Statistical Methods for Engineers. Lab 2. Prerequisite: 5023 or 4203 with permission of instructor. Analysis of variance, multiple comparison test, 2n factorial arrangement of treatments, fractional factorials, randomization, design of experiments, simple and multiple regression, no credit. 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 events, dependence and independence, random variables, moments, distributions of functions of random variables, weak laws of large numbers, central limit theorems.

4203 Mathematical Statistics I. Prerequisite: MATH 2365. Introduction to probability theory for students who are not majoring in majors in statistics or mathematics. Probability, dependence and independence, random variables, univariate distributions, multivariate distributions, moments, functions of random variables, moment generating functions.

4213 Mathematical Statistics II. Prerequisites: 4203 and MATH 2365. An introduction to statistical theory for students who are not majoring in statistics or mathematics. Sampling distributions, maximum likelihood methods, point and interval estimation, hypothesis testing.

4223 Introduction to Statistical Inference. Prerequisites: 4113 and MATH 3013. Sampling distributions, point estimation, maximum likelihood methods, Rao-Cramer inequality, confidence intervals, hypothesis testing, sufficiency, completeness.

4910 Special Studies. 1-6 credits, maximum 6. Prerequisite: consent of instructor. Special subjects in statistics.

4993 Senior Honors Project. Prerequisites: departmental invitation, senior standing, Honors program participation. A guided reading and research program ending with an honors project under the direction of a faculty member, with a second faculty reader and an oral examination. Required for graduation with departmental honors in statistics.

5000 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 science and engineering students. Descriptive statistics, basic probability, probability distributions, fundamentals of statistical inference, hypothesis testing, regression, one-way analysis of variance. Applications in biology, chemistry, comparative experiments, correlation and linear regression, introduction to categorical data analysis.

5023 Statistics for Experimenters II. Prerequisites: graduate standing and 4023 or 4053 or 5013. Analysis of variance, covariance, use of variance components and their estimation, factorial experiments, randomized blocks, Latin square designs, multiple comparisons, sampling of experimental units, factorial arrangements of treatments, single degree of freedom comparisons, experiments involving split-plots.

5033 Nonparametric Methods. Prerequisite: one of 4023, 4043, 4053, 5023 or consent of instructor. A continuation of 4013 and 4023, concentration on nonparametric methods. Alternatives to normal-theory statistical methods; analysis of categorical and ordinal data, measures of association, orderings of association and goodness of fit, orders and tests of fit.

5043 Sample Survey Designs. Prerequisite: one of 4013, 4033, 5013 or consent of instructor. Constructing and analyzing personal, telephone and mail surveys. Descriptive surveys including simple random, stratified random designs, systematic design, frame construction, non-sampling errors, use of random number tables, sample size estimation and other topics related to practical conduct of surveys.

5053 Time Series Analysis. Prerequisite: 4043 or 4053. An applied approach to analysis of time series in the time domain and the frequency domain. Descriptive techniques, probability models for time series, autoregressive processes and forecasting. Box-Jenkins methods, spectral analysis and use of computers.

5063 Multivariate Methods. Prerequisites: 4043 and 4023 or 4053 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 4633. Measure theoretical presentation of probability, integration and expectation, product spaces and independence, conditioning, different kinds of convergence, limit theorems and the statistical applications. Same course as MATH 5113.

5133* Bayesian Decision Theory. Prerequisites: 4113 and MATH 2633, or consent of instructor. An introduction to Bayesian decision theory, large sample estimation and tests of hypotheses, concepts of asymptotically efficient, nonparametric tests.

5213* Bayesian Statistics. Prerequisites: 4113 and MATH 2633. Statistical inference, subjective probability, decision theory, Bayesian estimation and hypothesis testing, regression, Bayesian predictive distributions, loss functions, minimum risk decisions, conjugate families of distributions, Bayesian procedures and forecasting. Box-Jenkins methods, spectral analysis and use of computers.

5203 Large Sample Inference. Prerequisites: 4223 and 5113. Different types of convergence in probability theory. Consistency, asymptotic normality, large sample estimation and tests of hypotheses, concepts of asymptotically efficient, nonparametric tests.

5213* Bayesian Decision Theory. Prerequisites: 4223 and MATH 4633. Statistical inference, subjective probability, decision theory, Bayesian estimation and hypothesis testing, regression, Bayesian predictive distributions, loss functions, minimum risk decisions, conjugate families of distributions, Bayesian procedures and forecasting. Box-Jenkins methods, spectral analysis and use of computers.

5203 Experimental Design. Prerequisite: 5023 or 4023 with consent of instructor or 4053 with consent of instructor. Review of basic concepts and principles of experimental design, role of randomization, interpretation of effects and interactions in multifactor designs, error term selection principles, multiple comparison procedures, split-plot experiments, incomplete block designs, confounding of factorial effects in 2n and 3n series of factorials, single and fractional replication optimum seeking designs, pooling of experimental over time and/or space, crossover and switch back designs.

5203 Experimental Design. Prerequisite: 5023 or 4023 with consent of instructor or 4053 with consent of instructor. Review of basic concepts and principles of experimental design, role of randomization, interpretation of effects and interactions in multifactor designs, error term selection principles, multiple comparison procedures, split-plot experiments, incomplete block designs, confounding of factorial effects in 2n and 3n series of factorials, single and fractional replication optimum seeking designs, pooling of experimental over time and/or space, crossover and switch back designs.
5523 Theory of Linear Models I. Prerequisite: 4233, and MATH 3013, and one of 4023, 4053, or 5023. Multivariate normal distributions of quadratic forms, general linear models, Markov theorem, variance components, general linear hypotheses of full rank models.

5533* Theory of Linear Models II. Prerequisite: 5523. Advanced regression topics; mean model theory and application to fixed models; orthogonal polynomials; data structures, observational and sum of squares identities, mean model identities. Building linear models from data structures, parameterizations and reparameterization, conventional linear model theory, variance components, computing techniques.

5540 Computing techniques. Prerequisite: 4113 or 4203. Deriving estimates and variances of estimates for different sampling designs. Mathematical development of sampling. Consideration of simple probability sampling including simple random, stratified random, cluster and multistage sampling. Estimation techniques including ratio and regression techniques. Determination of sample sizes and allocations.


6123 Advanced Probability Theory. Prerequisites: 5113 or MATH 5113, and MATH 4673. Sequences of random variables, convergence of sequences, and their measure theoretical foundations. Different kinds of convergence in probability theory, Characteristic functions and their applications. Laws of large numbers and central limit theorems. Conditioning, introduction to stochastic processes. Same course as MATH 6123.

6213* Advanced Statistical Inference. Prerequisites: 5113, and 5203 or 5213. Estimation, maximum likelihood, Cramer-Rao inequality, confidence intervals, Neyman-Pearson theory of testing hypothesis and power of test.

6323 Advanced Design of Experiments. Prerequisite: 5303 and S5355, and B5365. Block designs for technical education with emphasis on experimental designs, such as mutually orthogonal series of Latin Squares, balanced and partially balanced incomplete block designs, confounded and fractionally replicated designs. Response surface methodology. Theory of factorial arrangements of treatments. Confounding of factorial effects. Fractional replication of fractionations, 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. 1-8 credits, maximum 12. Investigation of special problems in the theory and application of statistical methods and 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 philosophical bases for technical education with emphasis on programs, purposes, and objects of technical education in the variety of environments in which such programs exist.

4112 Instructional 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. Comparative study of occupational education in other countries compared with contemporary practices in the United States to provide a basis for an enlarged, critical view of technical education.

5223 Curriculum Development in Technical Education. Prerequisite: consent of instructor. The relationship of mathematics, science, technical specialty and general education in technical curriculums. Contemporary practices in constructing, revising and evaluating technical curricula.

5253 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.

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. 3-5 credits, maximum 6. Workshop in all phases of theater production: acting, stagecraft, lighting, makeup, publicity and box office.

4433 Scene Design for Theater and Television. Prerequisite: 2613 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 stag, 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.

4503 Theater Graphic Techniques. Fundamental theater graphic techniques to communicate theatrical design ideas.

4713 Stage Costume History I. Lab 2. Comprehensive history of theatrical costume from ancient Egypt to 1700. Impact of fashion on the stage. Practical experience preparing for departmental productions.

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.

4993 Senior Honors Project. Prerequisites: departmental approval, program of study, 2613 and 2623. A guided reading and research program ending with an honors thesis of performance under the direction of a faculty member, with second faculty committee member. Required for graduation with departmental honors in theater.

5010 Seminar in Theater. 1-3 credits, maximum 12. Prerequisite: consent of instructor. Individual or group studies, literature or history 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 style, especially Shakespeare, Restoration comedy, absurdist drama, and avant-garde 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 contemporary acting, building technics, special preparations for professional acting auditions.
TRADE AND INDUSTRIAL EDUCATION (TIED)

Field Experience In Industrial Practice. 2-6 credits. maximum 16. Prerequisite: consent of instructor. Supervised work 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.

Trade and Industrial Occupational Experience. 1-24 credits, maximum 24. Prerequisites: two years teaching experience, satisfactory completion of the required basic core and credit hour of intern or instructor. Credit to be determined by a special skill competency examination.

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 exceptional and handicapped students.

Instructional Procedures in Trade and Industrial Education. Prerequisites: 4344 and full admission to Teacher Education. Methods and techniques for effective teaching and leading in classroom and shop instruction. Emphasis on the use of instructional aids and competency development. No credit for students with credit in QAE 4103.

Trade Technical Information. 1-4 credits, maximum 6. Prerequisite: consent of instructor. New developments in scientific and technical knowledge that are relevant to current trade practices.

Coordinating Trade and Industrial Youth Activities. Prerequisite: selected vocational education courses at 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.

Safety, Organization, and Management of Learning Facilities. Prerequisite: full admission to Teacher Education. 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.

Trade Analysis and Instructional Planning. Prerequisite: full admission to Teacher Education. Analysis of trades and occupational job activities; development of course outlines and specific instructional materials for shop and laboratory courses.

Interdisciplinary Cooperative Education. Prerequisites: 3203 and 4344. Techniques and procedures for coordinating cooperative education programs. Includes planning, organizing, implementing and evaluating effective cooperative programs.

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.

Evaluation of Instruction. Prerequisite: 4103. Principles of evaluation and methods for applying these principles to improve the effectiveness of vocational education programs.

Teaching Related Information. Selection of job-related topics common to most trades with procedures for incorporating those topics into the regular curriculum.

Guidance, Placement and Follow-up in Occupa-

UNION EDUCATION

University (UNIV)

American Studies Survey. Provides an overview of the United States society and culture using an interdisciplinary approach. Study of U.S. culture from sociological, anthropological, language, educational, political, geographical, economic, and historical perspectives.

University Academic Services Freshman Orientation. Prerequisite: beginning freshman standing in University Academic Services. Designed to help students orient themselves into high school. Students become aware of campus resources and administrative structures; explore various majors and careers; increase awareness of current issues in education; and enhance study skills and attitudes which can contribute to academic success.

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 personality types; 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.

Innovative Studies. 1-3 credits, maximum 6. Lab 0-6. May be used for not more than two semesters for new or experimental topics or techniques.

Directed Study. 1-6 credits, maximum 6. Prerequisite: written application approved by instructor, the department head, and the dean of the student’s college. Independent study, research, field work or internship.


VETERINARY MEDICINE

Veterinary Medical Orientation I. Prerequisite: first-year standing in the 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.

Veterinary Medical Orientation II. Prerequisite: 5111. 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.

Basic Science Elective. 1-8 credits, maximum 8. Prerequisite: third-year standing in the College of Veterinary Medicine. Problems in the basic sciences. Graded on pass-fail basis.

Veterinary Medical Specialty Conference I. Prerequisite: third-year standing in the College of Veterinary Medicine. Specialty conferences for third-year veterinary medical students presented by visiting professionals. Limited number of field trips will be conducted in which special presentations will be made.

Clinical Science Elective. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Problems in the clinical sciences. Graded on pass-fail basis.

Veterinary Medical Clinic Conference I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Presentation and discussion of selected clinical cases by fourth-year students and interdepartmental faculty groups. Graded on pass-fail basis.

Veterinary Medical Clinic Conference II. Prerequisite: 6711. Presentation and discussion of selected cases contributed by fourth-year students and interdepartmental faculty groups. Graded on pass-fail basis.

VETERINARY MEDICINE AND SURGERY (VMS)

Jurisprudence and Medical Economics. Prerequisite: second-year standing in the College of Veterinary Medicine. Veterinary jurisprudence, medical economics, ethics, public relations, records, banking, insurance, U.S.D.A. and F.D.A. regulations. Visiting lectures in specialty areas assist in this course.

Veterinary Surgery I. Prerequisite: second-year standing in the College of Veterinary Medicine. The pathophysiology of surgery including an introduction to techniques in veterinary surgery and anesthesiology.

Veterinary Radiology I. Prerequisite: second-year standing in the College of Veterinary Medicine. Veterinary radiology, radiological diagnosis and therapy; use of radioscopes in veterinary medicine.

Elective I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective III. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective IV. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective V. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Veterinary Medical Orientation I. Prerequisite: first-year standing in the 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.

Veterinary Medical Orientation II. Prerequisite: 5111. 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.

Basic Science Elective. 1-8 credits, maximum 8. Prerequisite: third-year standing in the College of Veterinary Medicine. Problems in the basic sciences. Graded on pass-fail basis.

Veterinary Medical Specialty Conference I. Prerequisite: third-year standing in the College of Veterinary Medicine. Specialty conferences for third-year veterinary medical students presented by visiting professionals. Limited number of field trips will be conducted in which special presentations will be made.

Clinical Science Elective. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Problems in the clinical sciences. Graded on pass-fail basis.

Veterinary Medical Clinic Conference I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Presentation and discussion of selected clinical cases by fourth-year students and interdepartmental faculty groups. Graded on pass-fail basis.

Veterinary Medical Clinic Conference II. Prerequisite: 6711. Presentation and discussion of selected cases contributed by fourth-year students and interdepartmental faculty groups. Graded on pass-fail basis.

Veterinary Medicine and Surgery (VMS)

Jurisprudence and Medical Economics. Prerequisite: second-year standing in the College of Veterinary Medicine. Veterinary jurisprudence, medical economics, ethics, public relations, records, banking, insurance, U.S.D.A. and F.D.A. regulations. Visiting lectures in specialty areas assist in this course.

Veterinary Surgery I. Prerequisite: second-year standing in the College of Veterinary Medicine. The pathophysiology of surgery including an introduction to techniques in veterinary surgery and anesthesiology.

Veterinary Radiology I. Prerequisite: second-year standing in the College of Veterinary Medicine. Veterinary radiology, radiological diagnosis and therapy; use of radioscopes in veterinary medicine.

Elective I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective III. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective IV. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Elective V. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of clinical rotations.

Veterinary Medical Orientation I. Prerequisite: first-year standing in the 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.
6523 Surgery II. Prerequisites: 5422 and third-year standing in the College of Veterinary Medicine. Lectures and discussions in operative techniques and practices in veterinary surgery.

6532 Radiology II. Prerequisites: 5431 and third-year standing in the College of Veterinary Medicine. Lectures and demonstrations pertaining to the interpretation of radiographs and evaluation of radiological therapy. Continuation of 5431.

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. Graded on a pass-fail basis.

6614 Systemic Medicine and Diseases of Domestic Animals II. Prerequisite: third-year standing in the College of Veterinary Medicine. Lectures and discussion of reproduction in domestic animals including principles of parturition and dystocia, genital diseases and breeding problems.

6621* Systemic Medicine and Diseases of Domestic Animals III. Prerequisites: 6614 and third-year standing in the College of Veterinary Medicine. Continuation of 6614.

6642 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 the College of Veterinary Medicine. Continuation of 6543. Graded on a pass-fail basis.

6651 Foreign Animal Diseases. Prerequisite: third-year standing in the College of Veterinary Medicine. Lectures and discussions involving diseases of the world. Emphasis on diseases which are a potential threat to United States livestock.

6700 Preceptorship Clinic. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Clinical rotation in the College of Veterinary Medicine. Continuation of 6700. Graded on a pass-fail basis.

6710 Non-OSU Clinic. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Clinical rotation off the OSU campus. Graded on a pass-fail basis.

6712 Intensive Care Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Management of small animal critical care cases.

6714* Radiology Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnostic radiography, ultrasonography, and other special imaging modalities.

6720 Special Clinic I. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine or graduate veterinarian. Special assignments for introductory clinical studies in the following: selected species clinic, herd-health program; necropsy, clinic pathology and parasitology; diagnostic laboratory; and special aspects of the basic sciences.

6722 Equine Medicine and Surgery Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of equine diseases.

6724* Anesthesiology Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Management of clinical anesthesiology in various domestic species.

6726 Special Clinic II. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine or graduate veterinarian. 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.

6732 Diagnostic Microbiology, Parasitology, Pathology I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Introduction to necropsy and diagnostic laboratory procedures. Case discussions and review of important diseases of domestic animals.

6743 Special Clinic III. 1-8 credits, maximum 8. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Continuation of VMS 6730. Graded on a pass-fail basis.

6742 Small Animal Medicine Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of companion animal medical diseases.

6752 Small Animal Surgery Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of companion animal surgical diseases.

6756 General Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, 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.

6762 Food Animal Medicine Clinic I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of diseases of food animal medical and surgical diseases.

6782 Clinic Pool I. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Semi-elective clinical assignment.

6783 Field Services and Herd Health Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Diagnosis, prognosis, treatment and prevention of animal diseases. Students conduct introductory clinical studies by assignments in the following: field services unit and herd health studies of animals in herds, bands and flocks entered in health programs of the Boren Veterinary Teaching Hospital.

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.

6812 Emergency Medicine and Surgery Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Special lectures and discussions of selected topics in veterinary medicine and surgery.

6852 Diagnostic Microbiology, Parasitology, Pathology II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Application of necropsy and diagnostic laboratory procedures. Advanced case discussions and reviews of important diseases of domestic animals. Continuation of 6732.

6882 Clinic Pool II. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Semi-elective clinical assignment.

6900 Clinical Problems and Investigation. 1-6 credits, maximum 8. Prerequisite: 6756, 6856, 6864, or graduate standing in the College of Veterinary Medicine. Lectures and laboratory investigations in selected areas of veterinary medicine.

6910 Advanced Clinics. 1-6 credits, maximum 6. Prerequisites: 6795, 6856, 6864, 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 depart- ment. Anesthesiology of animals.

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.

6981 Clinic Pool III. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Semi-elective clinical assignment. Graded on a pass-fail basis.

VETERINARY PARASITOLOGY, MICROBIOLOGY AND PUBLIC HEALTH (VPARA)

3123 Animal Hygiene. Prerequisite: junior standing in the College of Agriculture. Principles of sanitation and of prevention 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. 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 5993.

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 in the College of Veterinary Medicine or consent of instructor. Viruses responsible for disease in domesticated animals.
532* 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 for food products of animal origin; and human nutrition, environmental and consumer aspects of food quality.

532* 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.

533* 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.

540* Techniques in Parasitology. Prerequisites: graduate standing and general parasitology; hematology or concurrent enrollment. Experimental application of basic research and teaching techniques in hematology and parasitology. Individual participation and analysis of experimental situations and techniques applicable to all areas of zoology.

544* 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.

552* 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.

553* Veterinary Virology. Prerequisites: 5313, MICRO 4124 or equivalent. Detailed analysis of theoretical and practical problems relating to the molecular biology of virus replication including virus structure and replication strategies, virus-host cell interactions, and anti-viral mechanisms.

561* Biology of Parasites. Prerequisite: graduate standing, general parasitology, or consent of instructor. A systematic and ecologic approach to the study of parasitology. Host-parasite relationships, physiology, ecology and behavioral aspects of parasitic organisms.

572* 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.

583* Veterinary Diagnostic Microbiology. Lab 6. Prerequisite: graduate veterinarian status or consent of instructor. Laboratory methods employed in the isolation of microorganisms and application of these methods in the diagnosis of specific animal diseases.

600* Research Thesis. 1-11 credits, maximum 45. Prerequisite: candidacy for the Ph.D. degree. Permission problems for graduate student to meet thesis requirement of the Ph.D. degree.

611* Seminar. 1-6 credits, maximum 6. Prerequisite: graduate standing. Subjects for study and discussion for graduate students.

620* Advanced Concepts In Veterinary Immunology. Prerequisite: 5113 or BIOC 3653 or MICRO 3254. Induction of immune responses, host defense mechanisms, immunoregulation, antigen presentation and immune recognition by B and T lymphocytes, using contemporary research publications.

681* 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. Epidemiological principles in the practice of veterinary preventive medicine.

6711* Veterinary Preventive Medicine. Prerequisites: 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: 5425 or equivalent. The application of epidemiologic techniques to disease investigations in veterinary medicine. A group discussion format. Also a prerequisite to the application of epidemiologic principle to population disease problems.

6763 Special Topics in Veterinary Immunology. Prerequisite: one course in immunology or consent of instructor. Selected areas of current interest in veterinary immunology. The subject matter varies from year to year.

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 written consent of department head. Lectures in cellular and tissue pathology, pigments, inflammation, disturbance of growth and circulation 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 standing in the College of Veterinary Medicine or 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.

6524* Pathology of Infectious Diseases. Prerequisite: 5425. Pathology of specific infectious diseases of animals, including those communicable to man, foreign animal disease, and methods employed in their diagnosis.

6613* Avian and Laboratory Animal Diseases. Prerequisite: 5425 or written consent of department head. Biological characteristics, husbandry, diagnosis, prevention, and treatment of diseases of birds (including domestic poultry) and selected species of animals used in teaching and biomedical research.

6811 Differential Diagnosis. Prerequisite: fourth-year standing in the College of Veterinary Medicine. The differential diagnosis of diseases of domestic animals.

6823* Diagnostic Pathology Clinic. Prerequisite: fourth-year standing in the College of Veterinary Medicine. Participation in animal necropsy, clinical pathology and clinical parasitology laboratories. Study of disease diagnosis, prognosis, prevention and treatment of diseases.

6910 Seminar. 1-2 credits, maximum 6. Prerequisite: graduate standing in biological sciences. Literature and research problems in veterinary pathology.

6920* Diagnostic Pathology. 1-4 credits, maximum 20. Prerequisite: graduate standing in the College of Veterinary Medicine or written approval 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 preparations individually and are required to formulate their own diagnosis.

6930* Laboratory Animal Pathology. 1-2 credits, maximum 2. Prerequisite: 6701 or written consent of department head. Etiology and pathogenesis of spontaneous and experimentally induced diseases of common used species of laboratory animals.

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 carcinomas 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 six for the M.S. degree and 12 for the Ph.D. Re-enrollment permits the study of two to four different groups of organs and systems of the animal body. A consideration of the pathogenesis and the morphologic, 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.

6973* Advanced Hematology. Prerequisites: 5425, or equivalent, graduate standing, written consent of department head. Hematologic aspects and the methods employed in their diagnosis.

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.

3013 Biological Microtechnique. Lab 3. Prerequisite: BISC 1403 or 1603. Techniques for preparation of biological materials for microscopic examination. Same course as BOT 3013.

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.

3123 (N) Sp'd Human Heredity. The impact of genetics on human endeavor.

3133 Evolution. Prerequisite: BISC 3003 or 3024. Development of the evolutionary concept: specialization, evolutionary mechanisms and phylogenetic concepts.

3143 Oceanography. Ocean basins, circulation, tides, waves, chemistry of sea water, life in the ocean, ocean communities.
3154 Vertebrate Natural History. Lab 6. Prerequisite: BISC 1603 or equivalent. Introduction to vertebrate classification and functional organization: systematic, life histories, reproduction, behavior and ecological adaptations of vertebrates, emphasizing local fauna. One weekend field trip required.

3204 (N) Introductory Anatomy and Physiology. Lab 2. Prerequisites: CHEM 1215 or equivalent and BISC 1214 or equivalent. Structure and function of the human body. Lab sections consider human and domestic animal physiology. No credit for students with prior credit in BISC 1603.

3500 Colloquium on Environmental Crises. 1 credit. Max 4. Current environmental issues presented by films and seminar. Critiques written on several selected presentations.

3513 Principles of Wildlife Ecology. Prerequisites: 60 credit hours, including BISC 3034. Application of ecological principles to the production and control of natural populations.

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. Fundamental principles of parasitology 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 development of sea urchin, frog, chick and pig. Experiments using frog and mouse, including the molecular level.

4154 Histology. 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 morphological, 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 biological (including premedical, pre-dental and pre-veterinary) sciences.

4225* Mammalian Physiology Laboratory. Lab 6. Prerequisite: BISC 4215. Laboratory experiments that illustrate function of organs, organ systems or mechanisms of whole body physiology. For students majoring in basic biological sciences.

4231 Seminar in Physiology. Research and the integration of experimental biology with applied biology. Active participation by the student.

4243* Introductory Pharmacology. Prerequisite: 3204 or 4215. Major drugs classes based on their predominant use or principal action in the body; base physiologic action and modification 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 BIOC 3653. Cellular activities and fundamental physiologic processes.

4404* Ichthyology. Lab 6. Prerequisite: 3115 or consent of instructor. General biology, morphology, physiology, and behavior 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 of management of wildlife populations and habitats, with emphasis on current management problems.

4523 Wildlife Management Techniques. Prerequisite: 4513, ENGL 3323 strongly recommended. The semi-structured format includes problem identification, project planning and design, land use surveys and mapping, wildlife populations and habitat analysis, data interpretation, development of project area research and 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, 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 4. Prerequisite: consent of instructor. Participation in faculty research or execution of a problem formulated by the student.

4750 Honors Study in Zoology. 1.5 credits, maximum 5. Prerequisites: 90 credit hours, GPA of 3.00 in 18 or more hours in zoological courses, approval of department head and proposed supervising instructor. Individual study in the development of zoological concepts. Extensive reading, literature search and special experimentation. An individual problems course for the gifted student.

5000 Research for Masters Thesis. 1-6 credits, maximum 6. Prerequisite: approval of major adviser. Independent research for the Master's thesis under the supervision of graduate faculty member.

5010 Graduate Seminar. 1-3 credits, maximum 10. Prerequisite: consent of instructor. Discussion of selected topics.

5020 Special Problems. 1-4 credits, maximum 10. Prerequisite: standing and consent of instructor. A report of results obtained is to be placed in Department files.

5030* Teaching Zoology. 1-4 credits. Maximum 4. Prerequisites: senior or graduate standing and consent of Department head. Supervised teaching in the Department laboratories. Attendance at seminar on problems involved in teaching zoology in college.

5070 Developmental Biology. Prerequisite: BISC 3014 or equivalent. The molecular basis of developmental events. Cell division, interaction, differentiation, migration and death as developmental mechanisms. Developmental aspects of carcinogenesis and teratology.

5110 Problems in Physiology. Prerequisite: consent of instructor. Investigations in physiology for graduate and advanced undergraduate students. Same course as PHSI 5110.

5113 Ecology. Lab 3. Prerequisite: consent of instructor. The development of ecological principles and their use in analyzing the organization, function and causation of behavior. Emphasis on the adaptiveness of vertebrate behavior and the use of behavior in clarifying evolutionary relationships.

5123 Behavioral Ecology. Prerequisite: BISC 3034 or equivalent. Study of the behavior of free-living animals in their natural environment, especially in terms of natural selection and adaptation. A synthesis of ethology, population genetics, sociobiology, and evolutionary theory. Largely descriptive and generalized with limited emphasis on mathematical theory.

5133 Evolutionary Ecology. Lab 2. Prerequisite: BISC 3034. Ecological concepts dealing with contemporary evolutionary processes, not phylogeny. Life history traits, R and K selection, sociality, kin and group selection, speciation, competition, predation, plant-animal coevolution, niche theory, species diversity and biogeography. General models and mechanisms, with examples drawn from all kingdoms.

5143 Ecological Computer Modeling. Lab 3. Prerequisites: BISC 3034, BISC 5133 strongly recommended. Use of BASIC to write programs that model simple concepts in ecology and behavioral biology. Use of interactive program packages that model more complex ecological and evolutionary phenomena at the computer console. No prior experience with computers or programming necessary.

5203 Physiological Systems Modeling. Lab 1. BASIC programs to model and analyze simple physiological processes. Models to evaluate more complex physiological processes. No prior experience with computers or programming necessary.

5213 Comparative Physiology. Prerequisites: 4264, BISC 3014, or BIOC 3853. Comparison of circulation, digestion, excretion, respiratory, reproductive and sensory systems of vertebrates, invertebrates. Same course as PHSI 5213.

5223 Membrane Biophysics and Bioenergetics. Prerequisites: PHYS 1214, and BISC 3014 or BIOCH 4113, or CHEM 3354 or PHYSC 3313. Application of biophysical, biochemical and biological techniques to the study of the structure and function of membranes and membrane components, kinetic measurements, spectroscopic techniques and diffractive techniques. Application of these illustrated with current research problems. Same course as PHYSC 5353.

5413 Principles of Ecotoxicology. Prerequisites: BIOC 3653 and consent of instructor. Integration of major processes involved with transport, exposure and response of biological systems to xenobiotics.

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. Prerequisite: consent of instructor. Application of ecological and evolution 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.

5459 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.


5553 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.
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 hours credit. Student should ascertain the topics before registering for this course a second time. Same course as PHSI 6110.

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